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PHYSICIAN KNOW THYSELF*

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If, as the poet tells us, "the proper study of mankind is man," then perhaps a proper study for doctor-kind is the doctor. It is because I believe this to be true that I have dared to paraphrase the words of St. Luke in my title. We doctors study our patients intensively, exhaustively, and perhaps, even exhaustingly, but how often do we study ourselves? How often do we pause to ask what makes us behave the way we do? How actually do we behave, or how does our behavior affect our patients or others? Not often enough, I venture to say.

The behavior of the doctor falls rather naturally into three categories—his behavior as individual physician toward his patient or other individuals in the professional relationship, his collective behavior, as when with his fellows he organizes to further some joint interest, and his behavior as a citizen and member of society. We may shorten these terms to professional behavior, political behavior and social behavior of the physician. I shall have some remarks to make on each of them, but chiefly on the first. There are, of course, two other categories of professional behavior of the physician, his behavior as teacher and as scientific investigator. I shall not discuss them at this time, although they are of great personal interest to me. They are not importantly within the scope of my present objective.

With regard to the doctor's behavior toward the patient, I shall draw first upon the wisdom of one of my great teachers—the late Lawrence J. Henderson—physician, chemist and philosopher, but also, on occasion, patient. In a scintillating address delivered to Harvard Medical students in 1934, Henderson began by pointing out that whereas mathematics, physics, chemistry and biology are nowadays successfully applied to the problems of medicine, science has made little if any contribution to the personal relations between physician and patient, and these have made no noteworthy improvement in a century. In the early part of his scientific career Henderson had been deeply impressed by the concept of the generalized physico-chemical system formulated by the American physicist, Willard Gibbs. In later years he had been greatly intrigued with the social philosophy of the Italian sociologist, Pareto. The latter had described a generalized social system which Henderson found analogous, in some respects, to Gibbs' physico-chemical system. Both are made up of heterogeneous components, the interactions of which determine the nature of the system as a whole. The components in this physico-chemical system are molecules and ions; in the social system they are people of varied constitutions, reaction patterns, experience, and interests. From these generalities Henderson draws three conclusions which we may well find useful in the practice of medicine. They are as follows:

1. That "A physician and a patient make up a social system."
2. That "In any social system the sentiments and the interactions of the sentiments are likely to be the most important phenomena."
3. That "The physician should see to it that the patient's sentiments do not act upon his sentiments, and, above all, do not thereby modify his behavior, and he should endeavor to act upon the patient's sentiments according to a well considered plan."

The gist of all this, if I understand it aright, is that before he can truly know his patient the physician must truly know and understand himself. In the Hendersonian philosophy the word "sentiment" acquires great significance. Henderson refuses to define it, but gives instead concrete examples of what he means by it. Nor will I attempt a definition. I am sure we all can grasp the term's implication. In the case of ourselves we doubtless regard "sentiment" as synonymous with "conviction." In the case of others are we sometimes more likely to think of sentiments as prejudices?

It is customary to think of medicine as both a science and an art—whatever that means. Science is of recent origin; medicine is very ancient. It would

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seem then that it was long an art before it became a science. Dr. Ian Stevenson in Harper's Magazine for April, 1949, claims that medicine is not yet a science. His point is that "what makes a science is not the collection of facts, but the organization and generalization of those facts and the formulation and understanding of the general laws which govern them." Medicine, Stevenson believes, has not achieved this stature and will not "until the basic laws of health and disease have been disclosed. But the search for these laws," he continues, "has hardly begun. No discipline can claim a greater array of equipment by which its research is carried on, yet none is inferior to medicine in organizing its knowledge into coherent principles."

Stevenson may have overstated his case, but he has a point no doubt. Most of us will feel that medicine has at least some claim to being a science even in terms of Stevenson's definition, but hardly a first-class one. It all depends on what we include in the word "medicine." The so-called medical sciences are sciences without doubt, but are they medicine? Medicine also is an art, for its scientific knowledge must be applied and made useful. It is not a fine art, but art in the sense of a skill, or, insofar as it deals with the application of scientific fact, a technology. But the art of medicine long antedates the science. Before scientific medicine existed, medical art operated through the application of fetish, mystery—holy or unholy—and the practical aspects of common human experience. It still does so today, to some degree, perhaps more than we realize. The practitioner should seek to distinguish between the application of scientific knowledge with true detachment and the mere exercise of his art in accordance with his sentiments. More of the behavior of all humans is based on rationalization or on emotion than on reason, even that of the most intellectually gifted. If the physician knows this he can avoid certain pitfalls that otherwise might engulf him.

How shall the physician gain insight and true perception of his own motivation? The Freudians would doubtless answer—only by complete psychoanalysis. But it is obvious that every practitioner of medicine cannot undergo psychoanalysis, nor is it at all clear that it would be desirable if possible. I have thought for some years that it would be educationally valuable, and occasionally therapeutically valuable also, if some brief but soundly planned psychiatric survey were carried out on all first year medical students as a part of the regular curriculum. I believe students would learn much about themselves in this way which later would be valuable to them in practice, and those students with maladjustments might receive important help. There is, however, much sentimental objection to such a plan, and I have never made any progress in my own school toward getting it adopted.

If no help is given the medical student or young doctor in the understanding of his own personality by his teachers, then he can only gain such understanding for, and by, himself, through introspection and experience. He should be given the opportunity to learn the elementary principles of human psychology, and these he should continuously use in interpreting his own day-to-day behavior. He should frequently throughout his professional life ask himself, why did I do that, why did I say that? Am I being governed by professional jealousy, by self-interest, by ambition? Of course such self-scrutiny can never attain to complete objectivity. The individual may find that often he cannot answer these "whys." If so he should seek competent psychiatric guidance. No stigma need attach thereto. Or he may think he understands himself perfectly, when the truth is his understanding is quite faulty. The latter is the sort of case that the survey I have recommended might identify.

At this point we may revert to the third and last Hendersonian precept, which amounts to this: the doctor understanding his own motivation, sentiments, his likes and dislikes, will consciously refuse to allow the patient's sentiments to effect his own behavior, and he must make use of the patient's sentiments solely to promote his patient's welfare and for nothing else. The doctor is in the paradoxical position of needing to be both interested and disinterested at the same time. He must be interested in restoring the patient to health, but disinterested in his own relation to the case.

One of the most important elements in the pursuit of disinterestedness by the doctor is refraining, under all circumstances, from making any moral judgment of the patient, or at least of expressing any such, or allowing it to govern his action. There must be no argument about the patient's prejudices. No matter how revolting to the doctor the patient's sentiments may be, the doctor must consciously steel himself against being influenced in his behavior by them. Whenever any of my house staff or students tell me a patient is "uncooperative" I rebuke them. The word is tabu. It carries an inescapable implication of annoyance or irritation. God knows it may be true, but if true, it is a truth that the doctor must repress. If a doctor cannot do this in any given case he should retire from it and let another doctor take over. Religion sometimes makes mischief in the doctor-patient relationship. Doctors, like patients, may be adherents of any of the religious so-called orthodoxies, or they may be agnostics or atheists, or perhaps be totally unreligious. The doctor well may, insofar as he is able, seek to imitate the perfect humanity of Jesus, but never should he permit his religious beliefs to influence in any other way his dealings with the patient. The physician should not take over the function of minister, priest or moralist. On the other hand, he should facilitate in every way the ministrations of such persons when that is the desire of the patient.

In gaining an understanding of the patient's sentiments or motivations, a primary requisite is listening. I tell all my students that on taking a case they should first listen attentively to all the patient can or will tell them spontaneously. Such listening serves

two purposes. It informs the doctor and it comforts the patient, at least if the doctor's demeanor convinces the patient that he will make his best effort to be helpful. I try to convince my students that their first interview with a patient is an occasion of fundamental importance. Far from being merely one of history taking, it is rather the establishment of the doctor-patient relationship, the social system of Henderson. In accordance with how the doctor conducts himself the patient's confidence may be gained or lost. If gained, conditions become as favorable as possible for successful treatment. If lost, some other doctor had best take charge. Psychologists tell us that in the interview three elements are to be sought—what the patient tells, what he resists telling, and what he is unable to tell. The last requires some sort of analytic procedure to extract. All are important in the evaluation of the patient as an individual. Such evaluation of the whole patient the physician must attempt in order that he may treat him as a whole, and not simply in his parts. A good way to begin is for the doctor to try to imagine himself in the patient's predicament. This is helpful, but not enough. He must also try to picture himself not only in the patient's predicament, but in it and also with the patient's reaction pattern.

And this brings us to the matter of the placing of responsibility in the care of the patient. The complexities of modern medicine have brought about a state of affairs in which many doctors of different skills may be needed in the case of a single patient. It is because of this that group practice has developed. I am convinced that group practice, of one sort or another, is indispensable in modern society, if all the people are actually to get medical care as good as that which existing medical knowledge makes possible. A host of specialists are constantly in demand, nor can topnotch care be given without them. Yet the more specialized they become, the less are they competent to take responsibility for the care of the patient as a whole. Therein lies one of the great paradoxes and frustrations of modern medical practice, and every effort must be made to overcome it. The solution lies, I think, in bringing about a state of affairs in which, in every case, no matter under what circumstances medical service is being provided, some single physician must have final responsibility for the care of the patient as a whole. In other words, some one doctor must be in command, and remain so until he relinquishes it to another, either at his own desire or the patient's. When a general practitioner is in charge of a patient there need be no fuzziness about responsibility. The general practitioner is obviously in command of the whole situation. If he calls in consultants, then it is his responsibility whether to follow their advice or not. When, however, he sends the patient to a hospital for study, in which he has no ward privilege, then the hospital staff becomes responsible. The situation is not so clear, however, when a patient, as they often do, goes first to a specialist, let us say an ear, nose and throat man. What is the responsibility of the specialist under such circumstances? My philosophy would be, under these circumstances, the specialist being a doctor of medicine, being the only doctor in the case, in spite of being a specialist, perhaps a rather narrow specialist, is still responsible, until he turns the case over to another, for the patient's total medical welfare. What actually happens, I suspect, in most such instances, is that the specialist goes sweetly along examining and caring for only part of the patient, unless some symptom or local sign suggests to him that more than local disease exists, then he calls for help. Because hidden disease may produce no symptoms, there is always some risk in caring for a local disease without proper study of the whole patient. The demands of adequate medical care are met when a physician capable of studying the patient as a whole is consulted first and does the necessary referring to specialists. I consider that I, as an internist, am competent to assume such responsibility, and I do assume it when a patient comes to me directly. Because I have a special interest in the thyroid within the broader field of internal medicine, patients are sent to me in consultation for an opinion on their thyroid status. Under such circumstances I regard my responsibility as that of a consultant only and send an advice to the referring doctor. His is the responsibility for the whole case, and he can follow my advice or not as he likes. If later he asks me to accept the patient for treatment, then I regard myself as responsible for the patient's entire medical welfare.

Responsibility for the patient's whole care in the milieu of a teaching clinic has been for many years a major concern of mine. The patient in the public wards of a teaching hospital has a considerable group of professional people caring for him in one way or another, fourth year medical students, interns, residents and visiting or attending staff physicians. Such a group will constitute either a mob or a well organized team with responsible leadership. In the medical service of the Massachusetts General Hospital I have told all visiting physicians assigned to ward duty that I hold them completely responsible for the welfare of all patients admitted to their wards. I tell the house staff and students that they are members of a team, and that each of them has the responsibility for performing to his best ability that portion of the patient's care which the team leader assigns to him. In some clinics the resident is given the final authority for the patient's care, and the visiting physicians play the role of consultants and teachers only. Such an arrangement works well enough, but we have always preferred the other.

You may regard these remarks on responsibility as old stuff, which it is, but I have reviewed the principles of responsibility because I have very frequently seen them lost sight of in actual practice. The best example of complete fuzziness of responsibility in medical care, a state of chaos in fact, often occurs in the case of the sick doctor, or doctor's wife. The doctor himself usually makes the world's worst patient,

because he often cannot refrain from trying to run his own case, and the doctor's wife runs into bad luck when her husband, and several of his friends, are all looking after her at once, with none of them assuming the responsibility of command or leadership.

At the beginning of this talk I tried to make the point that objectivity or detachment is an essential to good practice. Now no one can be detached or objective about himself when ill, and indeed he will have trouble enough trying to do so when well. Nor can a doctor act quite objectively about any person dear to, or dependent on him. When ill himself he should pick his physician and then obey his directions without hampering him with endless questions and arguments. Let him try to be a "good" patient. He can learn a lot by so doing. The subjective study of disease, that is to say, experiencing an illness, should be made a part of the medical curriculum. Nor in my opinion should any doctor act as physician to his wife or children so long as another is procurable, and preferably not to very close friends or relatives or employees. Toward none of such people can he be without bias. I have seen a number of cases in which doctors caring for either themselves or their wives have made confusion worse confounded. Everybody and nobody was caring for the patient!

Having established a good rapport with the patient and gained some understanding of his personality and situation, and having by appropriate examinations and studies achieved diagnoses both of the disease and of the patient, I hope I have said enough to make clear the significance of this differentiation—it then becomes necessary to plan and carry out treatment.

In regard to the treatment of the disease in contrast to the care of the patient, I would like to utter certain warnings. In planning treatment the doctor is sometimes led into temptation. He is tempted to use a certain therapeutic procedure because he has a special interest in it. A surgeon is inclined to operate if any possible reason for so doing can be found, or to rationalize in favor of surgery when he cannot discover any indications by sound logic. Indications for treatment must be arrived at detachedly—not by the rationalization of a doctor's desire. The degree of bias in favor of a pet method of treatment in the case of various specialists of course varies enormously. The noblest may be altogether free of it, but they are in a minority. It's a tough business when, in the case of a narrow specialist, some new medical discovery throws the treatment of a disease which has been largely paying the freight for him, into an area totally outside of his own discipline. He then may be faced with the alternative of seeing his practice wither, or taking time out for training in a new branch of medicine. Think of the harvests of tonsillectomies of bygone years. I know nose and throat men who, seeing the handwriting on the wall, are developing a way out by learning another type of surgery. Hard as such developments may be for the doctor, the welfare of patients must always take precedence over the welfare of doctors.

The general practitioner or the internist, whom I still think of as also a general practitioner with limitations, is better able to choose therapies without bias. He is more free to pick from all the methods available the one with the greatest promise of relief to the patient's peculiar affliction. Of course even such a one cannot altogether escape temptation. He may be tempted to hold onto a patient and treat him by a medical procedure which he can give himself when a surgical one would be preferable. In the thyroid field in which I have worked for many years, I have seen remarkable changes in the treatment of Graves' disease. Prior to the introduction of iodine in 1923 we preferred x-ray therapy. Then we swung to subtotal thyroidectomy after preoperative iodine therapy. Indications were fairly clear up to that point, but now, with the advent of radio-active iodine and antithyroid drugs, we really have three types of treatment, all to some degree effective, none of them perfect, and at times it is a difficult job to choose between them.

Another hazard is the investigative urge. It is only through research that medicine makes progress, and there can be no argument about medical progress being essential to human welfare. But the first time a new treatment is used inevitably is an experiment. It can be said that the doctor should not experiment on his patient. The answer to that is, we have to experiment. But experimentation can be conducted so that the patient's welfare is safeguarded. The introduction of all the new wonder drugs was experimental, but such experiments should be conducted on humans only when there is a reasonable chance that the experimental therapy will give more benefit than any previously existing one. The practitioner should always regard critically the advice of inventors of new therapies. Being human they cannot avoid some bias in favor of their brain children. In other words, he must not accept new therapies solely on the evaluation of their discoverers. New forms of therapy are tried in the balance of practice by many physicians, and if they are good they survive; if they are found wanting, they eventually are abandoned. Or good forms of therapy give way to newer and better ones. Recall how sulfa drugs were supplanted by antibiotics in the treatment of pneumonia, for treatments come and treatments go but the art goes on forever! Each doctor with his wits about him, who plays a part in this continual process of mass evaluation of therapeutic procedures, does better by his patients, and gets more happiness out of his professional work, than he who tags along in the wake of medical progress uncritically and unproductively.

The indications for treatment having been determined dispassionately, the question becomes, what shall we say to the patient? The most important point here is that it is not what we say to the patient that

counts, but what he thinks we have said. How he interprets our remarks and what emotional effect they have on him. We doctors often think we have discharged our duty when we have given our advice, our directions to the patient, etc., but we have not. It is our further duty to find out how much of what we have said is comprehended, to what extent have we created fears or apprehensions which will stand in the way of the successful carrying out of the treatment we think indicated. Not infrequently when I ask a patient what a doctor previously in charge of his case had told him, he replies, "He didn't tell me anything." It is to be presumed that the doctor did tell him something, but the point is it didn't register. The doctor didn't get his advice across and accepted. This amounts to a therapeutic failure quite as bad perhaps as giving the wrong drug, or not giving the right one, or doing a wrong operation.

An essential ingredient in the make-up of the good physician is conscience; super-ego the Freudians call it. I prefer the old fashioned term. Most of us, I am sure, have active consciences, and how at times in the practice of medicine, they do plague us! I have always thought the words of the prayer book "We have done those things which we ought not to have done, and we have left undone those things which we ought to have done and there is no health in us," apply particularly to the practice of medicine. Certainly the doctor should make this confession in his heart at frequent intervals in all sincerity, but he should take it as a challenge always to do better and not let it get him into the way of despair. Since we are not omniscient, we are bound to make mistakes in the practice of medicine. Some of these may do our patients serious injury. I would make the points, first, that we must try to profit by our errors, and second, that when they are due to what may be reasonably called normal human frailty, we do not permit ourselves to become overly depressed by them. When, however, it is clear to us that there is an element of negligence, then our consciences will truly plague us and rightfully so.

There are occasions when our consciences let us down—fail to inform us where our duty lies. Such situations arise when we are torn between conflicting loyalties, as for example, our duty to our patient vs. our duty to his family or to the community, when these are inimical one to another. Such problems are not medical at all, but moral. One may need the help of a moral philosopher to settle them. A few years ago I asked a minister, Dean Willard L. Sperry of the Harvard Divinity School, to discuss them with our hospital staff and students. He was very helpful, and I am happy to say that he has expanded the remarks he made on that occasion into a little book entitled, "The Ethical Basis of Medical Practice." I commend it to you heartily.

The matter of self-justification or face saving in medical practice must be mentioned. That to admit error is for the doctor to lose caste, is commonly believed. No doubt there is some truth in this, but my experience has been that the public has increasing respect for complete candor on the part of the doctor, and that nowadays the doctor may lose more face by trying to save face than by forthrightly admitting his mistakes or by saying he doesn't know, rather than by throwing some bluff. The relation of the doctor to the autopsy is pertinent in this connection. Alan Gregg has made the point that if the public ever learn that they will get better medical care when autopsies are universal, there will be no more requesting of autopsy permission, rather autopsies will be demanded by the patients' relatives. The doctor on occasion has reason to dread the denouement of the autopsy. It would be so much less harassing quietly to bury one's mistakes. This is natural enough human behavior, but while it may be natural it isn't noble, therefore, I believe the doctor always should strive for an autopsy in the case of every patient who dies while under his care. It is one of the trials that the highest type of medical practice requires.

About the collective, especially the political behavior of doctors, I only wish to make the point that insight is as necessary as in individual behavior. When they engage collectively in political behavior, which they seem nowadays to be doing to an ever greater extent, they should understand their motivations quite as well as in dealing, as individuals, with patients, but I am sure that for the most part they do not. Ponder a moment the question—whose battle are we fighting? Whose medicine is it anyway, the doctor's or the patient's?, and in so doing give heed to lay opinion as well as to that of the organized profession. "Oh wad some power the giftie gie us to see oursels as others see us." The others in our case are the laymen.

Finally, a few words on the social behavior of the doctor, and I will have done. Not long ago I conversed with a life-long friend, an archaeologist, about the behavior of doctors as cultured persons. "They are intellectually very isolated," he said "and getting more so. In the early days at the X Club there were physicians like Dr. L and Dr. C. who could talk interestingly and authoritatively on other subjects than medicine. They were in fact delightful conversationalists, also good doctors, but now all the doctors will, or can, talk is shop, shop, shop."

Of course there is a tendency for those in any walk of life to foregather with one another socially, and then inevitably talk shop, but the doctors are perhaps the greatest offenders in this direction. They segregate themselves in clubs, and by the same token drive others out. Lawyers associate at least with financiers and businessmen, besides other lawyers, but the doctor often meets such people only professionally. Of course these remarks do not apply to the little community with perhaps but one doctor. He perforce must associate with others than his kind or become intellectually a hermit.

The correction for such tendencies are fairly obvious, namely, the development of secondary pursuits or interests—hobbies, public service or philanthropic enterprises. For maximum satisfaction in living there must be an avocation to balance vocation, and it must be creative in one way or another, or satisfying in that it helps make the wheels of your community go round.

These remarks, like those on responsibility, may seem to you banal and platitudinous, but I assure you I have known many doctors who have no interests outside of their professional work. They work until they are exhausted, and in an exhausted state they can do nothing creative. The spectacle of a man whether doctor or other, who works himself to pieces so that he may save enough ultimately to retire, but when the time for retirement comes, has no other interest to keep him going, is truly pathetic. In this regard I would like to recommend to you Mr. Winston Churchill's little essay entitled "Painting as a Pastime." It is a little gem of wisdom, and also beautiful English prose. It may be helpful in your own case, or it may be just the right book to prescribe for a patient. By the way, on the matter of books I am reminded of the wise remarks of that delightful physician, the late Gerald Webb of Colorado Springs. He said that nearly anyone with a modicum of brains can be taught to prescribe the right drug, but it takes a doctor with insight and discernment to prescribe the right book for a patient. I believe that he had something important.

And now I have finished. I thank you for your kindness in giving me the opportunity to address you, and for your charming hospitality.

Cardiac Catheterization In The Diagnosis Of Congenital Heart Disease

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Until a very few years ago, the diagnosis of congenital heart disease was about as far as most clinicians could go when faced with a patient born with a defective heart. It was recognized that those with cyanosis had generally a poorer outlook for health and life than those without cyanosis, and that many of both types were apt sooner or later to develop bacterial endocarditis or heart failure. The exact anatomical deformities present could in a few cases be predicted with reasonable accuracy, but in the majority, exact diagnosis was a pleasant academic pastime between the clinician and the pathologist, with the odds heavily in favor of the pathologist.

Rather suddenly, however, the diagnosis of congenital heart disease became no longer a matter of pure intellectual curiosity. The development of a successful procedure for the cure of patent ductus arteriosus by Dr. Robert Gross of Boston, followed by the relief of cyanosis in the tetralogy of Fallot by Dr. Alfred Blalock of Baltimore, gave impetus to intensive surgical effort toward the repair of congenital heart defects. Immediately it became necessary to have more exact preoperative diagnosis of the anatomical errors present in these cases.

Already the clinical methods of diagnosis had been greatly advanced by the classical studies of Maude Abbott and Helen Taussig. But the inherent variability of clinical and x-ray signs too often led to error, and many patients were refused operation in spite of having remediable lesions, or unexpected findings at operation would render the exploration useless.

Twenty years ago Forssmann in Germany had demonstrated the feasibility of passing a fine ureteral catheter by way of superficial veins into the right side of the heart and through it into the pulmonary artery. This procedure offered the possibility of getting a great deal more information about the structural and functional abnormalities present in congenital hearts. It has been applied to this purpose in America by several investigators, especially by Warren, Dexter, Bing and Cournand.

The information to be gained from catheterization of the heart and pulmonary vessels depends upon the fact that normally the right side of the heart and the pulmonary artery contain venous blood of low oxygen content, while the left side of the heart and pulmonary veins contain arterial blood of high oxygen content. Moreover the blood pressure in the right ventricle and pulmonary artery is quite low and about equal in both, while that in the left ventricle approximates arterial pressure. Therefore by measuring pressures at various points, and the oxygen content of blood samples taken at these points, it can readily be seen that a great deal of information as to existing defects can be deduced from variations from the expected normal in the pressure and oxygen saturation figures. Also the catheter, which is radio-opaque, can often be seen under the fluoroscope to pass through defects in the auricular or ventricular septum. Another diagnostic aid that is beginning to demonstrate its usefulness is angiocardiography, where techniques of rapid radiography make possible the visualization of the heart and great vessels after the injection of opaque solu-

tions by vein or through the cardiac catheter.

When the South Carolina Heart Association just one year ago began its program of setting up heart clinics over the state, the Medical College in Charleston was selected as the center for diagnosis and treatment of congenital heart disease. Equipment for this purpose was purchased by the Heart Association, and funds were made available both for diagnostic hospitalization and for surgical treatment of indigent congenital heart cases referred by any physician in the state.

The equipment used in our clinic includes a Sanborn Poly-Viso Cardiette for simultaneously recording the electrocardiogram and pulse pressure waves from the cardiac catheter; a Sanborn Electromanometer for converting the pressure pulses into electrical waves for recording; a Waters-Conley oximeter for continuous, immediate measurement of blood oxygen saturation; and a Sanchez-Perez rapid cassette changer for use in angiocardiography.

The catheterizations are performed by a trained team drawn from several departments at the Medical College. One physician and an assistant pass the catheter and take blood samples. A radiologist guides the passage of the catheter by fluoroscopic control. An anesthetist is used for young children, although none is needed in older children and adults. Two physicinas operate the pressure recorder and the oximeter. The patient is connected to a direct reading electrocardiograph and the heart rhythm is observed continuously during the whole procedure. A technician of the chemistry department receives the blood samples for gas analysis.

Under local anesthesia the catheter is inserted into the median vein at the elbow and guided into the subclavian vein, superior vena cava, right auricle, right ventricle and pulmonary artery. As the catheter is withdrawn, pressures and blood samples are obtained at various points. Except when these are being done a constant drip of saline or glucose is maintained through the catheter to prevent clotting.

Though potentially a dangerous procedure, many thousands of these determinations have been done at various centers with few untoward events. The most important danger is the production of arrhythmias from stimulation of the endocardium by the catheter tip. The arrhythmias are quickly recognized by continuous observation of the electrocardiogram, and disappear if the catheter is withdrawn slightly before proceeding. A few illustrative cases from our experience with this technique over the last five months are presented:

Case 1. A 7 year old white female. For the first time one month ago found to have a heart murmur. Never cyanotic, mild exertional dyspnea. Loud grade 2 or 3 systolic murmur over whole left chest, maximal at 2nd and 3rd left intercostal spaces near sternum. Blood pressure 95/60. EKG showed right axis deviation. X-rays of chest showed moderate enlargement, more on right, fulness in pulmonary conus and artery. Catheter passed through auricular septal defect on 2 occasions.

Pressure:	*Oxygen*	*Saturation*:
Superior vena cava		79%
Right auricle		100%
Right ventricle	45/0	89%
Pulmonary artery	40/15	93%

Impression: large auricular septal defect.

Recommendation: not amenable to surgery.

Case 2: 8 year old colored female. Heart murmur known since infancy. No disability or cyanosis. Loud machinery murmur at 2nd and 3rd left intercostal spaces. Blood pressure 115/60. EKG: left axis deviation. X-ray: minimal enlargement, full pulmonary artery, active hilar pulsations.

Pressure:	*Oxygen*	*Saturation*:
Superior vena cava		70%
Right auricle		73%
Right ventricle	70/0	73%
Pulmonary artery	35/15	98%

Impression: pulmonary stenosis and patent ductus arteriosus.

Recommendation: the lesions are mutually compensatory and no operation indicated.

Case 3: 12 year old white female. Heart murmur heard first 3 months ago. No dyspnea or cyanosis. A loud, continuous machinery murmur maximal between 2nd left intercostal space and clavicle. Blood pressure 120/50. X-ray: slight enlargement of both ventricles, exaggerated pulsations in pulmonary artery. EKG: normal tracing, no axis deviation.

Pressure:	*Oxygen*	*Saturation*:
Superior vena cava		62%
Right auricle		73%
Right ventricle	35/0	75%
Pulmonary artery	30/10	87%

Impression: uncomplicated patent ductus arteriosus.

Operation: Successful ligation of patent ductus. Murmur disappeared completely. 2 months after operation, no murmur, blood pressure 110/80. X-ray: heart normal in size.

Case 4: 11 year old colored male. Cyanosis since infancy, marked limitation of activity. Clubbed fingers and toes, harsh systolic murmur and thrill in 2nd left intercostal space. Red blood count 6,000,000. X-ray: marked right-sided enlargement. EKG: right axis deviation.

Pressure:	*Oxygen*	*Saturation*:
Superior vena cava	—	74%
Right auricle		78%
Right ventricle	100/0	76%
Left ventricle	100/0	89%
Pulmonary artery	0	76%

Impression: tetralogy of Fallot.

Operation: left subclavian artery anastomosed to left pulmonary artery. No change in murmurs postoperatively, but boy can now run and play with other children, though still cannot keep up with them.

From these and many other cases, we are convinced of the value of these measurements in the accurate diagnosis of congenital heart disease. We believe they are indispensable in any instance where surgical treatment is contemplated.

Behavior Disturbances In Children*

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While in present day psychiatry and in medicine generally it is recognized as important to avoid any artificial mind-body separation, there is still convenience in classifying the behavior disorders of children in two general groups—those due to definite organic factors and those due largely to functional or psychological causes.

In the group of disorders due to organic causes, to list some of the more important, are disturbances of behavior due to the effects of encephalitis, trauma to the brain, epilepsy, the endocrinopathies, juvenile paresis. In this paper I shall consider briefly some of the possible effects of encephalitis, and trauma, and then go on to the functional behavior problems.

As there have not been in recent years any severe and widespread epidemics of epidemic encephalitis, child psychiatric clinics have not seen as many behavior problems due to this disease as were seen in the twenties. Spasmodic cases occur, though, as do cases of other types of infectious encephalitis. And it is well to bear in mind that at times a relatively mild and perhaps unrecognized encaphalitis may occur in the course of measles or other of the infectious diseases of childhood, and that this apparently mild encephalitis may play some part in later developing behavior disturbances. The behavior disturbances following encephalitis often take the form of overactivity, with frequently destructiveness, impulsiveness, running away, stealing, lying, sex offenses, and evidences of emotional instability. The overactivity has been described as an "organic driveness" of brain stem origin. The anti-social behavior is not accompanied by any degree of remorse, but the child often is in some degree aware that he cannot control the behavior. Differentiation of cases showing this sort of post-encephalitic behavior from cases of psychopathic personality without organic basis may at times be difficult. In the absence of a clear-cut history, neurological findings (including the electroencephalogram), and psychological tests would have to be relied on. Neurologically there are frequently found disturbances of the aculomotor muscles, choreiform movements, loss of associated movements. Parkinsonism does not occur so frequently in children but is said to occur in 50% of post-encephalitis followed over a long period of time. On psychometric testing the post-encephalitic may show a disturbance of spatial orientation, interferring with his copying certain forms; poor memory for digits; or some impairment in his ability to judge weights. If the encephalitis occurs very early in life there may result marked mental deficiency. The possible devastating effect of early encephalitis is illustrated by the case of T. C., a Negro boy seen at age 8 at the request of a Public Health nurse because he seemed definitely mentally retarded. According to the mother he was the fourth of eight children and the only one that seemed in any way abnormal. She said that he had not walked until three, still could not talk plainly, had achieved neither bladder nor bowel control, and about twice a month was subject to episodes of laughing and crying, would run out in the street and was difficult to control. When examined, the child spoke a peculiar jargon, with only an occasional recognizable word, laughed in an odd way, and at times acted almost as if responding to hallucinations. At first the possibility of the child's being a schizophrenic was considered, though there was more display of affect and more interest in the personal environment than would be expected in childhood schizophrenia. Tentatively the case was diagnosed as congenital mental deficiency. However, it was learned that there had been two hospitalizations, the reasons for which the mother was very vague about. The record of one of these hospitalizations was available and revealed that the child had had an encephalitis at age 7 months and during the course of an otitis media. There had been definite spinal fluid changes, temperature had been 105°. It seemed fairly clear that the retarded development, emotional instability, and overactivity were due to this early encephalitis Treatment of severe post-encephalitic behavior problems seems on the whole of little avail.

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And for some of them institutional care is indicated.

A quite different case is that of B. H., an eight year old boy brought to the clinic because of his frequent running away, refusal to do anything his mother told him, a tendency to steal money from his parents, and temper outbursts towards a three-year-old sister. The onset of this sort of behavior was definitely dated as having followed an attack of measles about six months previously. He had posed no particular behavior problem prior to that. However, the mother did say that on beginning school he had not gotten along well, as others had picked on him, and at times she had not wanted him to play with children in the neighborhood because she was afraid they would "run over" him. The attack of measles had apparently not been a very severe one and the child had not been hospitalized. But in retrospect the mother recalled that his temperature had been quite high and that he had been a little drowsy. When examined he was found bright and alert. His I. Q. was 111. He said that he had come to the clinic because he lost his temper all the time, especially in dealing with his younger sister, and that he tried to control his temper but that he couldn't. An electroencephalogram showed a marked cortical dysrhythmia representing a petit mal type of seizure. Closer observation by the mother revealed that he was having occasional petit mal attacks. He was placed on Dilantin and no further seizures were noted over the next two months and his general behavior improved for a time, there being no running away and much less show of temper. However, at a later visit, the mother reported that he was again rather aggressive and playing hookey. And in talking with the boy, his attitude was that no one loved him, that everyone picked on him, and that his only retaliation was to be bad. It became clear that the behavior problem could only be partially explained by the cortical dysrhythmia and that there was a definite emotional problem present. This is a recent case and what will be the later developments under combined psychotherapy and suppressive drug therapy can't be foretold. However, the case is illustrative of the combination of fairly specific organic and emotional factors at times found in behavior problems and the multiple approach necessary.

In behavior disturbances that follow head injuries we also find that the prognosis does not depend solely on the extent or location of the damage but partly on psychological factors in the child's home both before and after the injury—that is on the attitudes of the parents and others in the child's environment. That point was stressed by Dr. Lauretta Bender in a study of brain injured children at Bellevue. Soon after a head injury, she points out, there may be much anxiety and fear with a regression of behavior to more childish levels, and careful attention and reassurance are needed during that stage which may last only 7-10 days. In those cases that develop chronic behavior disorders there is a close resemblance to the post-encephalitic disturbances, with perhaps impulsiveness, destructiveness, stealing, lying, restlessness, excessive sex drive, insommia or sleep reversal, depression or elation. Often a pseudo mental deficiency is seen, manifested by poor school work but which is due to lack of attention rather than to a real mental deficiency. However, if epilepsy develops in the child as the result of localized damage, there does tend to be a progressive mental deterioration. But, on the whole, it was found that a group of brain-injured children, followed over a period of years made a surprisingly good adjustment. And while the electroencephalogram and special psychological tests are useful in detecting the presence of an organic factor in mild or questionable cases, the prognosis depends on a combination of factors, of which the organic is only one.

The following case is illustrative of some of the behavior problems that may develop following a severe brain injury. C. H. is a boy who in June 1948 at age eleven was struck over the left temporal region by a baseball. Two hours later he lost consciousness and was hospitalized. On the following day an extradural hematoma overlying the left hemisphere was removed and the middle meningeal artery ligated. On discharge about a month later there was a spastic weakness of the left side and practically complete loss of vision in left eye and loss of temporal vision in right eye. When seen in the out-patient clinic soon after leaving the hospital, his mother described his speech as at times jumbled, with words "all mixed up." In succeeding months, clinic notes made no further reference to any speech difficulty but described an increasing behavior problem and a tremendous appetite. There was frequent mention of his severe temper tantrums and the difficulty in controlling him. One physician in contact with the case was inclined to think the mother was spoiling the boy and felt uncertain as to just what part organic factors played in his behavior. An EEG in February 1949 was indicative of a generalized increase in cortical excitability. With this indication for suppressive medication he was started on Dilantin. There followed some improvement in his behavior which was paralleled by an improvement in the EEG. However, things have not gone too smoothly and recent reports describe him as flying into rages on little provocation, as picking on his younger brother, spending much time in bed reading funny books, and occasionally stealing. Perhaps contributing to the more recent difficulty, and illustrating the fact that we must give full consideration to all aspects of the problem and not over emphasize the organic factors even in such a predominantly organic case as this, was the hospitalization of both parents in the fall of 1949 for tuberculosis. The patient and his younger brother are in the home of a great aunt who does the best she can but who is employed as a schoolteacher and finds it difficult to provide the supervision and attention needed. Interestingly, the patient, who has attended school irregularly in recent months, has

shown that he can make fair grades even though he doesn't apply himself very hard. His I. Q. on a recent test was 81, which is within the dull normal range.

In the functional behavior problems, the general cause is that of conflicts in the emotional life, which means really a disturbance in the child's relationship to others. And the significant others are the members of the child's immediate family, the parents and siblings. And therefore we see the emphasis in child psychiatry on approaching the child's problem as a family problem. This is to some extent true of the psychiatric approach in general, but especially true in the case of the child because of the child's relative dependence. The child's problem then is considered not in isolation but in its relationship to the child's family setting. That being the approach, the child's mother, and at times the father or others in the family, are brought fairly actively into the treatment program. In the average child psychiatric clinic, the child is seen by the psychiatrist and the mother by a social worker. The social worker not only obtains a history of the child's problem from the mother and serves as a mediator between the clinic and family, and at times school, but she also tries to help the mother to see more clearly how she—and others in the family—are involved in the problem. She is encouraged gradually to bring out and to examine her own feelings and attitudes and to see in what way they are related to the child's problem. Psychiatrist and social worker in this sort of set-up naturally work in close collaboration. Such collaborative treatment is seen in the following case.

Jane O. was an eight-year-old girl who was brought to the clinic by her parents at her teacher's suggestion because of not doing her work though she had the intelligence to do it, and because of her rather rebellious, attention-seeking behavior, and her apparent inability to participate in group activity. Her parents were responsible, conscientious people but it soon became apparent in the clinic's contact with them that they were rather rigid, meticulous, and perfectionistic. It was learned that the father had said before the couple had any children that he couldn't stand children who weren't well behaved. There was one other child in the family, a baby of whom Jane was obviously rather jealous.

In Jane's first interview with the physician she presented the picture of an insecure child who attempted to cover her insecurity by demanding, aggressive, hostile behavior. She had hardly entered the office before she began grabbing objects, saying that she was going to take them home with her. She took all of the toys out of the cabinet, and at the end of the interview she refused to put them back and protested the termination of the interview.

Jane's parents when seen by the social worker at first attempted to deny that Jane was any problem, saying that they brought her to the clinic only at the teacher's suggestion and that she was no problem at home. Then they admitted that the child was stubborn and that she bragged about being bad. The social worker in this first interview stressed the importance of the parents' recognizing the existence of a problem before the clinic could be of any real assistance, and that if Jane were to be treated it would have to be a matter of co-operation and participation of all concerned. In following interviews the mother complained that Jane was becoming increasingly difficult, demanding attention and continuing to do bad things. Punishment did not seem to help—the mother said that Jane had at times been severely whipped and on one occasion locked in the attic for several hours, and despite this she would come to her father, tell of some wrongdoing and seem to invite further punishment. She seemed desperate for playmates but would play only with younger children and tended to antogonize other children by her need to be the center of the stage. The mother wondered if the child could have a brain tumor pressing on a nerve because she couldn't keep still. At another point the mother tended to blame the community for the child's troubles, saying that the people were cold and unfriendly. (We see here, as we often do in such problems, the mother's difficulty in accepting her share in the problem—first she would have it that the child is only a problem in school with the implication that it is the school's problem, then she looks for a physical cause which will more or less leave her out of it, and then she attempts to project her problem to the community, and it becomes the fault of the unfriendly commuity.) The mother further reported that Jane's school adjustment was such that the school authorities did not want her to return the next year.

In her next interview with the psychiatrist, Jane, seeing in the office a bridge built of toy blocks, asked who had built it. When told another girl, she immediately destroyed it, saying that she could do anything much better than the other girl. She was pretty aggressive in her behavior, but when no particular correction or criticism was forthcoming she seemed taken aback, more insecure and uncertain of what to do. Finally she built with blocks what she said was the physician's office, and then she proceeded to enact a scene in which she entered the office with a gun but with the physician seated without a gun. She seemed to be saying then in this play activity that she had come into the treatment situation on guard, with all her defenses up (with a gun), but the physician had not been particularly critical or controlling of her and seemed somewhat susceptible to her wishes (he was without a gun). She then placed other toy figures outside the office and said, "They are bad people that want to get in, but they can't get in here." Here she seemed to be expressing her feeling of security in the office, and perhaps her satisfaction in having the interview her own private affair, and also to be saying that she was leaving her badness on the outside.

Coincident with the enactment of this scene her behavior during the interview became less aggressive and destructive.

The father when seen by the social worker about a week later said that bringing the child to the clinic had lessened his and his wife's tension considerably.

In the next few interviews with the physician, there was much less aggression and hostility manifest, but there was still a strong need for recognition. (It seemed that she was gradually finding that she was accepted by the physician for herself, and that while he had certain limits that had to be observed—she couldn't break windows and she couldn't use the Dictaphone, for instance—he was not primarily interested in correcting or scolding her. In this setting she seemed to find less need for hostility.)

The mother, in her talks with the social worker, continued to project her difficulties on to the environment—they had moved to a new neighborhood and that had increased the difficulty—and she continued to ask further whether there wasn't some physical cause for the problem. She reported that the child was making enemies in the new neighborhood as she picked on the younger children and told exaggerated stories of her accomplishments. She was afraid to skate with other children or to ride a bicycle. She tried to make herself conspicuous whenever her parents were around and gave them no peace The social worker felt that the mother, who up to this point in the interviews had been rather on guard, with some underlying tension and hostility, now seemed on the point of desperation, and was able to bring out better her real feelings and to begin to establish a better relationship with the worker.

However, in view of the parents' continuing concern over the possibility of an organic cause for the behavior problem, the physician agreed to have an electroencephalogram made. But then the mother, surprisingly, seemed unable to bring herself to have this done. (With this mother's difficulty in accepting her part in the child's problem, and her need to find some other cause, it is possible that she unconsciously resisted a procedure which would tend to rule out more definitely the possibility of an organic cause. If that were done she would then have no loophole.) The mother emphasized what an effort it was for her to help Jane with her schoolwork. It was a burden she said because she was constantly thinking of all the other things she had to do, and she complained that her husband gave her no help with household duties.

It had become clear by this time that the mother was a tense, compulsive, anxious person, who partially controlled her anxiety by keeping herself busy. She was very exacting in her household duties and had to have her home and her schedule in perfect order. For Jane she had very definite ideas of the pattern Jane must follow, and she had difficulty in seeing beyond that rigid pattern. But the mother had come to where she could bring out better her personal feelings and problems in the interviews and she seemed appreciative of the help given her. In the next interview she reported that Jane was doing much better.

In the physician's further interviews with Jane she showed no marked change on the whole. She continued to seek for recognition and approval but in a more realistic way—demonstrating her ability in writing and arithmetic, and reporting that she no longer was getting spankings in school. And while she continued to be rather restless there was not the markedly aggressive behavior shown at the start of treatment.

The parents reported continuing improvement in Jane's behavior at home and in school. Treatment, which had been on a weekly basis for the most part, was discontinued after a period of about eight months.

The presenting symptom of the behavior disturbance may be any one of a wide variety—thumbsucking, night terrors, stealing, enuresis, masturbation, temper tantrums, seclusiveness, etc., etc. But it cannot be too much stressed that the symptom here, as in other fields of medicine, is but a more or less surface phenomenon expressive of some underlying pathology. And in the behavior problems the underlying pathology is some disturbance in the child's life that is causing him anxiety. Dr. Leo Kanner, Director of the Children's Psychiatric Service at Johns Hopkins Hospital has well described the meaning of the symptom in child psychiatry. He considers the symptom first in terms of a complaint item, a behavior phenomenon which has a certain nuisance value as far as the parent is concerned. And a particular symptom will vary in its nuisance value with the parent who happens to be involved He then refers to the symptom as an admission ticket to the doctor's curiosity, comparing the symptom to an admission ticket to a play which gives a few facts such as the title of the play, time and place of performance, but gives no inkling of the play's plot. Further the symptom represents the child's distress signal—unconsciously used but nevertheless a call for help with the underlying difficulty. At the same time the symptom represents—as with the adult neurotic symptom—a compromise solution of the child's difficulty, an effort at adaptation to the situation in which he finds himself. But most important to remember is that the symptom which the family will present as the problem to be corrected—thumbsucking, for instance—can't be effectively treated simply as a symptom. There is no one cure for thumbsucking any more than there is one cure for fever. And efforts at treating the symptom in isolation from the rest of the child's life are not likely to be very successful. And if an apparent success in treating and removing a symptom is achieved through simply making continuation of the symptom unpleasant, one would want to look carefully to see whether some other symptom didn't soon appear.

The story behind the symptom, then, is more important than the symptom. And the story behind the symptom will of course vary, but anxiety seems basic to symptom formation. And anxiety—that is, anxiety continued over any length of time and not just in response to some very transient situation—represents the lack of relative emotional security in the child. The child is able to enjoy a reasonable degree of emotional security and freedom from anxiety only when its basic emotional needs are provided by the parents. These needs seem to be: For genuine warmth and affection, without smothering; for acceptance as an individual in his own right; for consistency in attitudes towards him so that what is acceptable and what is not acceptable today is what is respectively acceptable and not acceptable tomorrow; and finally for avoidance of either undue harshness or undue leniency in discipline. Such basic principles seem easily understood and will be readily subscribed to by parents. But the fact that in practice they may not be observing one or more of these simple principles may not be so easily recognized. The parents of the child in the case just presented were intelligent, honest, conscientious people, and to the casual observer would probably seem good parents. Actually they were unduly perfectionistic and controlling, and somewhat over-protective. And if such underlying attitudes often may not be obvious to the neutral observer, it is understandable that they will be much less obvious to the parents themselves. The mother in a given case is not likely, for instance, to recognize that she is neglecting her children to a dangerous degree in a busy program of social or civic activities; or again that in her perfectionistic striving to have the child conform exactly to her preconceived and detailed pattern of what the child should be, she is forgetting important human values. She is not aware that these attitudes are hers because they are attitudes that have been built up unconsciously and are intimately related to her own particular emotional needs. It has been said that "there are no problem children but only problem mothers." Certainly there is much truth in that. But at times so much is made of the point that some come to feel that mothers are being unjustly criticized and we see articles written in defense of mothers. Actually, of course, there is no criticism of mothers—at least no criticism of their motivation—in the observation that children's problems seem related to their mothers' problems. A particular mother in her attitudes may seem an unfortunately bad influence for the child's emotional growth and development, but she is not a wilfully bad influence, only an unwittingly bad one. And if the mother can be helped with her anxieties, hostility or frustration so is the child likely to be helped.

One might ask what place, if any, the general practitioner has in all this. A treatment program has been described in which both the child and the mother are worked with fairly intensively, the physician seeing the child and a social worker the mother. The general practitioner, nor the private practicing psychiatrist can undertake treatment of that sort. But often the general practitioner will have a pretty good understanding of the family's composition, of the personalities involved, and of the emotional climate in the family group. It is true, as stated above, that the disturbing influences may not be too obvious, but may be an attitude that is expressed in rather subtle fashion. But where there is an obviously unhealthy relationship between parent and child, or between parents, and when the child presents a behavior disturbance not clearly related to organic factors, certainly the relationship of the child's symptoms to the intra-family disturbance is to be suspected. And some general counselling around this problem—which the parents themselves may well have suspected but need support in discussing—should be possible.

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Cardiac Evaluation In Combined Respiratory Vascular Disease*

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In the patient with chronic respiratory disease it is important to evaluate from time to time the proportionate role played by the lungs and the heart in the resultant areation failure.

The interest in this paper will be focused on a discussion of this problem, with special emphasis on practical methods to be used in assaying these two factors in the following group of cases:

1.—Asthmatic emphysematous patients with evolving right sided heart failure (cor pulmonale).

2.—Asthmatic emphysematous patients with heart disease other than cor pulmonale i.e. primary heart disease.

3.—Problems in differential diagnosis between (a) left sided failure with degrees of pulmonary edema—with and without paroxysms of cardiac asthma; (b) inflammatory lung disease; and (c) bronchial asthma.

The problem of cor pulmonale can be best understood by retracing the general concept of development of the pathologic states: chronic bronchitis, bronchial asthma, bronchiectasis and pulmonary emphysema.

Bronchitis, whether infectious or allergic in its inception, is reversible at the end of each paroxysm. After an indeterminable number of attacks, the operative mechanism leaves its pathological imprints which are manifold.

Reaction to injury in the bronchi tract is in terms of hypersecretion in the mucous glands with edema of the mucosal and sub-mucosal structures, plus peribronchial smooth muscle spasm. In the alveoli there is an abnormal diffusion of fluid across the semipermeable respiratory membrane. With this wetting of the alveolar respiratory membrane and the narrowing of the bronchial lumen ventilatory function is obviously hampered. There results a pocketing of air and fluid in the terminal bronchi and air vesicles. Explosive cough and forced respiratory effort results in over-distention and rupture of groups of alveoli. Trapped mucous and transuded fluid become a test tube culture medium for respiratory bacteria. With repeated such insults over a period of years there results structural respiratory disease: *bronchiectasis, emphysema* and *pulmonary fibrosis.*

With the development of this advanced anatomic state, all compressable tissue is impinged upon. The diaphragms are pushed down and are fixed. The intercostal spaces are widened and precordial dullness obliterated. There results an increased resistance in the pulmonary vascular circuit reflecting an increased work load on the right ventricle. Brill[1] has estimated that the pulmonary circulation can carry on up to the point of 60% increase in work load, or 60% obliteration of the pulmonary vascular bed.

Soma Weiss[2] and Blumgarte studied the velocity of blood flow in a series of patients with emphysema. Reporting on vital capacity, venous pressure and arm to arm circulation time, the following was determined: In individuals with moderate to marked decrease in vital capacity the venous pressure was normal to decreased and the circulation speed, normal to slightly accelerated. When the emphysematous state progressed to the point of a moderate increase in venous pressure and increased circulation time, right sided heart failure was eminent and the patient went rapidly down hill. Weiss postulated that just prior to this break in compensation that adequate circulatory dynamics were maintained by the last expendable heart reserve.

Hickam and Cargill[3] studied the effect of exercise on cardiac output and pulmonary arterial pressure in normal, cardio-vascular and pulmonary emphysematous patients. Pulmonary arterial pressure studies were by pulmonary arterial catherterization. Normal subjects during exercise showed no increase in intrapulmonary arterial pressure above the normal mean of 8 to 15 MM of Hg. The group with pulmonary emphysema showed an initially elevated pulmonary arterial pressure and there was a further substantial increase in pressure with exercise.

A. Zimmerman[4] measured pulmonary arterial pressures in five individuals during attacks of bronchial asthma. All patients had abnormally high pressures in the pulmonary artery. When the asthma was relieved by Aminophyllin, the pressure fell to subnormal level. Patients who were relieved by Adrenalin had an initial increase in pulmonary arterial pressure. The resultant cardiac output was greater in the group relieved with Adrenalin than in the group relieved by Aminophyllin.

Lewis Dester[5] studied the problem of pulmonary vascular dynamics in a series of patients (18) with a variety of chronic pulmonary lesions, i.e. asthma, pulmonary fibrosis and emphysema. A study of pulmonary arterial, arteriolar, and capillary pressures was made. Using the formula of Bozett and Lamport the index of pulmonary arteriolar resistance was calculated. Pulmonary capillary pressure was normal in all cases. Arterial and arteriolar pressure was elevated in 16 of the 18 cases investigated. Arteriolar resist-

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ance was increased 20 or more times. By comparison—in malignant hypertension of the systemic circulation peripheral resistance rarely increases more than four-fold. This gives a rough comparison of the capable work loads and reserve of the right and left heart. Dexter concludes that the circulatory difficulties incident to chronic pulmonary disease—"chronic cor pulmonale"—are directly related to the resistance to blood flow through the arterioles of the lungs.

The data presented by Weiss and enlarged upon by Hickam, Zimmerman, Dexter and others does much to clarify the complex problem of the response of the pulmonary circulation to pulmonary disease. Increased pulmonary arterial and arteriolar pressure precedes right heart failure and the resultant increase in systemic venous pressure. The last citadel of cardiac reserve is used to increase pulmonary blood flow to compensate for the disordered gaseous exchange.

Individuals with chronic lung disease are not exempt from heart pathology other than cor pulmonale: hypertensive, coronary, valvular, etc. The problem of dyspnoea and its evaluation becomes further complicated when it is realized that incidences of primary left sided failure with associated back pressure pulmonary hypertension can produce the wheezy physical signs of bronchial asthma (Milton Plotz[6]) and the cotton wool infiltration associated with primary atypical pneumonia and broncho- pneumonia.

The work of Richards, D. W., Jr.,[7] and McMichael, J.,[8] referable to high out-put and low out-put failure is applicable here. In individuals with considerable grades of destructive lung disease, as exemplified by advanced emphysema of chronic bronchial asthma, right sided and consequently left sided cardiac out-put is stepped up to compensate for the resultant faulty respiratory membrane. When right sided failure ultimately occurs, the failure is at a high out-put level, consequently there is a late reflection of the failure by circulation rate determinations. This is in contrast to the circumstance operative in primary left sided failure where the minute out-put is already low at the onset of failure, hence an exaggerated prolongation of the circulation time.

A number of cases grouped in series will illustrate the categories originally posed for discussion. Each patient has been observed for a period of several years. Detailed clinical and laboratory evaluation has been kept. Additional accessory data has been accumulated as follows:

1.—*Venous pressure* readings were recorded using a No. 18 needle in the median basilic vein connected by three-way stop cock to a manometer containing citrate solution. Pressure readings were recorded at the phlebostatic level. Venous pressure was recorded at rest and after exercise in the recumbant position (thighs flexed on the trunk rapidly until patient was moderately dyspnic).

2.—*Circulation time*, arm to tongue, was measured using Decolin (sodium dehydrocholate) injected rapidly through No. 18 needle.

3.—ECGs were studied with special emphasis on axis and strain patterns.

4.—X-rays and fluoroscopies of the chest were read to study cardiac silhouette and chamber enlargements.

5.—Vital capacity was recorded using simple bellous bag.

GROUP I
ASTHMATIC EMPHYSEMATOUS PATIENTS
With Evolving Right-Sided Heart Failure

Name	Age	Occ	Diagnosis	Ven. Pres.	Vit. Cap.	Circ. Time	EKG	Evaluation
Mr. ESM	70	CPA	Ch. Bronchitis Bronc. Asthma Emphysema	7 cm. 12 cm.	1.0 l. 24.0%	18 sec.	Rt. Ax.	Vent—— Circ——
Mr. EKM	55	Boil Mkg.	Ch. Bronchitis Bronc. Asthma Emphysema	4 cm. 6 cm.	1.2 l. 27.0%	13 sec.	Rt. Ax.	Vent—— Circ
Mr. HAB	50	Bus Drv.	Ch. Bronchitis Bronchiectasis Emphysema	13 cm. 16 cm.	2.4 l. 57.0%	13 sec.	Rt. Ax.	Vent—— Circ——
Mr. LSB	52	Trk. Drv.	Interstitial Fibrosis (pn 1946)	12 cm.	57.0%	12 sec.	Rt. Ax.	Vent——
Mr. TWR	60	Stone Cut.	(Silicosis) Interstitial Fibrosis	7 cm. 9 cm.	3.0 l. 70.0%	12 sec.	Rt. Ax.	Vent—— Circ
Mr. HEW	62	RR Br.	Ch. Bronchitis Bronc. Asthma Emphysema	9 cm. 10 cm.	1.8 l. 44.0%	16 sec.	Rt. Ax.	Vent—— Circ

Group I — Asthmatic Emphysematous Patients with Evolving Right-Sided Heart Failure (Cor Pulmonale)

Case No. 1—Mr. E.S.M. was a coughing, wheezing, severely dyspneic 70-year old accountant. He had experienced more colds and postnasal drainage than average all of his life. In 1938, he had influenza with broncho-pneumonia. This was followed by more and more respiratory infections and progressive dyspnea. In April 1950, he had an acute bronchitis and this culminated in extreme dyspnea requiring nasal oxygen, digitalization, etc. There was moderate ankle swelling during his acute illness; however, there has been very little peripheral edema since. Blood pressure 102/82. He had an ashy hue to ear lobes and cheeks and was dyspneic on conversation. The nasal turbinates were edematous and there was a mucopurulent nasal drainage. There was poor chest expansion with fixed inspiratory position. There was an increased anterior-posterior diameter of chest with moderate kyphosis. There were wheezes and coarse bronchial rales, grade II. Heart sounds were rhythmical without murmurs. A_2 equaled P_2. Size was not percussible. There were peripheral arteries consistent with age. There was no peripheral edema and the liver was not palpable. ECG showed right axis deviation. Venous pressure was 7 cm. at rest and 12 cm. on exercise. Circulation time 18 sec. Vital capacity was 1.0 liter or 24%.

Case No. 2—Mr. E.K.M., 55-year old boiler-maker, complained of recurring respiratory infections and progressive dyspnea for seven years. With colds he has had frank asthmatic attacks; however, except during these episodes, his dyspnea is entirely exertional. He has considerable rhinitis in the winter but is practically free of nasal symptoms in the summer. There has been no ankle edema. Temperature was 98. Pulse 84. Respiration 18. Blood pressure 114/86. There was slight shortness of breath with the exertion of undressing. The center of the face appeared slightly pigmented. The neck veins were not engorged. The chest was barrel shaped and held in inspiration position. Breath sounds were distant and there were wheezes and coarse bronchial rales, grade II. Heart sounds were distant, rhythmical and without murmurs. P_2 was greater than A_2. Heart size could not be percussed. The liver was not palpable and there was no peripheral edema. Radial arteries were consistent with age. Venous pressure 4 cm. to 6 cm. Circulation time 13 sec. Vital capacity 1.2 liters or 27% ECG—Right axis.

Case No. 3—Mr. H.A.B. was a 50-year old city bus driver. He complained of progressive cough, muco-purulent sputum and dyspnea since 1946. During the past years he has produced more than a cup of sputum in 24 hours, much of the time. He was forced to stop work six months ago because of weakness and fatigue incident to his cough and dyspnea. Bronchograms, July 1948, suggested minimal bronchiectasis. Blood pressure 120/86. There was cough with each deep breath and he was dyspneic on movement around the room. There was red nasal mucosa and pharynx. The neck veins were not engorged. The chest was barrel shaped and held in inspiratory position. Breath sounds are distant and there were faint wheezes and rales. The heart sounds were rhythmical without murmurs; size was not percussable. A_2 equals P_2. Liver was not palpable and there was no peripheral edema. Vital capacity was 2.4 liters or 57%. Venous pressure was 13cm. at rest and 16 cm. after exercise. The circulation time was 13 sec. ECG was right axis.

Case No. 4—Mr. L.S.B., 52-year old truck driver, complained of progressive dyspnea since pneumonia in 1946. He was confined to the S. C. Sanitorium for two months in the spring of 1949 with the discharge diagnosis of non-tuberculous disease of the lung. Lately, he had been extremely dyspneic on slight exertion and even during conversation. He produces a half cup of mucoid odorless sputum per day. Weight loss was from 152 to 130 pounds in two years. His past health has been good. There was a T & A in the 15th year. Blood pressure 110/78. There was an ashy color to skin and obvious dyspneic at rest. The nasal mucosa, mouth and pharynx were negative. There was an emaciated, thin small chest with limited expansion. The breath sounds were distant and post-tussive faint wheezes and coarse and crepitant rales were audible at the bases. The heart sounds were rhythmical without murmurs. P_2 was greater than A_2. The heart size could not be made out. The peripheral and retinal arteries were consistent with patient's age. The liver was not palpable. The neck veins were not engorged. There was no peripheral edema. Vital capacity 37%. X-ray of chest: Small chest without depression of the diaphragm or widening of the interspaces. (On fluoroscopy there was little decent of the diaphragm). There was a remarkable diffuse fibrotic process throughout the lungs. The transverse diameter of the heart was not enlarged. The broncho-vascular markings were increased. Venous pressure 12 cm. Circulation time 12 sec. ECG—Sinus tachycardia with prominent right axis deviation. There was a small Q-3 with inverted T-3.

Case No. 5—Mr. T.W.R., 60-year old stone cutter, complained of recurring cough for more than five years. He has had much more trouble in winter and the cough that developed during the past winter has persisted up to the present. His sleep has been interrupted by cough and he produces one to two tablespoons of thick muco-purulent sputum in 24 hours. He was dyspneic on slight exertion. There has been no peripheral edema. His father died with cancer of the larynx. Blood pressure 138/74. There was cough and audible wheezing on moving about the room. The neck veins were not engorged. There was poor chest expansion with wheezes and coarse bronchial rales. The heart sounds were distant and the heart size could not be made out. The liver was not pal-

pable and there was no peripheral edema. Venous pressure 7 cm. to 9 cm. Circulation time 12 sec. Vital capacity 3.0 liters or 70%. Right axis deviation.

Case No. 6—Mr. H.E.W., 61-year old brakeman, complained of bronchitis, chronic, since childhood. For the past two years he has more and more disabling cough, sputum and exertional dyspnea. He is sensitive to dampness, also to dust. He has had little rhinitis. He has lost 15 pounds in two years. Temperature, pulse and respiration were normal. Blood pressure 138/74. He was dyspneic on conversation, but not cyanotic. There was nasal turbinate edema and pallor. The neck veins were not engorged. The chest was fixed in expansion. Breath sounds were distant and there ware wheezes and coarse bronchial rales, grade III. The heart sounds were distant and the heart size could not be percussed; no murmurs. A_2 equaled P_2. The liver was not palpable and there was no peripheral edema. Venous pressure 9 cm. to 10cm. Circulation time 16 sec. Vital capacity 1.8 liters or 44%.

Case No. 7—Miss J.Q., 57-year old music school teacher, complained of ten years of progressive dyspnea. When first seen in 1942, there was marked dyspnoea and wheezing associated with a respiratory infection. There has been a progression of her shortness of breath up to the point that now it is difficult for her to carry on conversation or to do the slightest exertion such as dressing. Blood pressure 104/70. There was moderate pallor of the skin about the face. Neck veins were not engorged. The chest was held in fixed inspiration and there were wheezes and coarse bronchial rales, grade I. The heart sounds were rhythmical without murmurs. A_2 equaled P_2. Venous pressure 4 to 6 cm. Circulation time approximately 15 sec. Vital capacity 1.2 liters Height 65". ECG—Marked right strained pattern.

Case No. 8—Miss B.B., age 39, District Supervisor, Girl Scouts of America, was perfectly well up until a respiratory infection in 1945. Following this infection she noticed that she was short of breath and this has developed gradually to the point of extreme shortness of breath on slight effort. There has been no particular rhinitis and very little sputum. Blood pressure 110/72. Nasal turbinates were normal and neck veins were not engorged. Heart sounds were rhythmical without murmurs; no enlargement. There was an increase in the anterior-posterior diameter of the chest and the ribs were held in fixed inspiration. Breath sounds were distant and there were coarse bronchial rales and wheezing. Liver edge was not palpable. No peripheral edema. Vital capacity 3.0 liters or 91%. Chest expansion 32 to 34 inches.

Group II—Asthmatic Patients with Primary Cardio-Vascular Disease.

Case No. 1—Mr. J.B.P., 69-year old farmer, complained of cough, muco-purulent sputum, dyspnoea. In 1942 he had an x-ray of chest with the diagnosis of "bronchiectesis and a thickened pluera, right." In December 1948 he had a respiratory infection and since that time he has produced from one to two cups of muco-purulent sputum, daily and has had progressive dyspnoea, intractable cough and weakness. On examination, he was obviously fatigued. Blood pressure 144/94. There was nasal turbinate edema

GROUP II
ASTHMATIC PATIENTS
With Primary Cardio-Vascular Disease

Name	Age	Occ	Diagnosis	Ven. Pres.	Vit. Cap.	Circ. Time	EKG	Evaluation
Mr. JBP	69	Farm.	Ch. Bronchitis Bronchiectasis Hypertensive Disease	4 cm. 6 cm.	2.6 L. 64%	22 sec.	Lf. Ax.	Vent—— Circ——
Mr. FHR	38	CPA	Ac. Bronchitis Cardiac Asthma	22 cm. 30 cm.	2.8 L. 65%	35.5 sec.	BBB Rt.	Vent Circ——
Mr. MB	50	CPA	Hypertensive Disease Ac. Cor. Occ.	19 cm.		24 sec.	Po Occ.	Vent Circ——
Dr. CEW	53	Drg.	Ch. Bronchitis Bronc. Asthma Emphysema Myocardial Dis.	4.6 cm. 9.0 cm.	2.6 L. 56.0%	38 sec.	LBB	Vent—— Circ——
Mr. JFR	56	Stat.	Ch. Bronchitis Bronc. Asthma Cor. H. Disease Diabetes	9.0 cm. 12 cm.	2.2 L. 52.0%	19 sec.	LBB	Vent—— Circ——
Mr. LFL	69	Sales	Ch. Bronchitis Bronc. Asthma Cor. H. Disease	8 cm.	2.2 L. 48.0%	23 sec.	Nor Ax.	Vent—— Circ——

and redness, grade III, with muco-purulent post-nasal drainage. Neck veins were not engorbed. Heart sounds were distant and rhythmical. There were bilateral crepitant rales at the lung bases and distant breath sounds. Coarse bronchial rales with wheezes occurred after cough. There was no peripheral edema. Venous pressure 6 cm. and circulation time 22 sec. ECG—Left axis deviation. Fluoroscopy of chest showed left ventricular enlargement. Vital capacity was 2.6 liters or 64%.

Case No. 2—Mr. F.A.R., 38-year old CPA, complained of wheezing and cough. He had not done well for more than a year and complained mostly of epigastric fullness and discomfort. He developed an upper respiratory infection some five weeks before and since that time has had considerable wheezing at night. Four days before being seen he had a severe attack of asthmatic breathing at night which was relieved by intravenous Amenophlin. There had been no chest pain on exertion and no peripheral edema. Blood pressure 142/90. The patient did not appear uncomfortable on moving about the room or on conversation. There was a slight ashy appearance about the face and ear lobes. Neck veins were not engorged. Lung fields were clear except for faint wheezing after cough. Cardiac apex 10 cm. in the fifth left interspace. Sounds were rhythmical and there was a split first sound. The liver was not palpable and there was no peripheral edema. Venous pressure 22 cm., increasing to 30 cm. on exercise. Vital capacity 2.8 liters or 65%. Circulation time 35.5 sec. ECG—Right buncle-branch block.

Case No. 3—Mr. M.G.B., age 50, CPA, has been a known hypertensive since 1946. There had been a very fast pulse for more than a year. There is moderate exertional dyspnoea but no cough or wheezing. He developed chest tightness with cyanosis and was admitted to the hospital with temperature 102 degrees. There was marked cyanosis about the ear lobes and the neck veins were engorged. There were fine rales and wheezes heard over the entire chest. Blood pressure 100/60 (average blood pressure in health, 180/110). The liver was not palpable and there was peripheral edema. Venous pressure 19 cm. Circulation time 24 sec. ECG—Posterior myocardial infarction.

Case No. 4—Mr. C.E.W., age 53, druggist, complained of increasing dyspnoea with asthmatic breathing for 24 years. For the first ten years most of the difficulty was with respiratory infections during the winter. For the past two or three months he has noticed a marked progression in his symptoms, particularly in terms of weakness and dyspnoea. He was dyspnoic on conversation and there was an ashy hue about the ears. Blood pressure 112/70. Pulse 74. Respiration 18. Nasal mucosa was normal. Chest was held to an expansion and there was an increase in the AP diameter. There were wheezes and coarse bronchial rales, grade II. Heart sounds were distant and rhythmical without murmurs. P_2 was greater than A_2. Neck veins were not engorged. Liver edge was not palpable. There were very large varicose veins and no ankle edema. Venous pressure 4 cm., increasing to 9 cm. on exercise. Circulation time 38 sec. Vital capacity 2.6 liters or 56%. ECG—Left buncle-branch block.

Case No. 5—Mr. J.F.R., 56-year old statistician, has had perennial bronchitis and bronchial asthma since 1919. He has been diabetic for seven years. He had a coronary occlusion in March 1948 with second occlusion in March 1949. Lately he has been asthmatic to the point of dyspnoea at rest. Blood pressure 144/96. Respiration 18. Nasal turbinate edema and pallor, grade II. The neck veins were not engorged. His chest was markedly emphysematous and there were wheezes and coarse bronchial rales, grade III. Heart sounds were rhythmical except for occasional premature beat. Heart size was not made out. The liver edge was not palpable and there was no peripheral edema. Venous pressure 9 cm., increasing to 12 cm. on exercise. Circulation time 19 sec. Vital capacity 2.2 liters or 52%. ECG—Residual effect of coronary occlusion with interference to intraventricular conduction system.

Case No. 6—Mr. L.R.L., 69-year old retired salesman, complained of rhinitis and perennial bronchial asthma since 1945. During this interval he had attacks of precordial pain on effort, diagnosed as coronary pain. Lately, his dyspnoea had become so severe that exercise was not permissable. Blood pressure 138/92. He was severely asthmatic and uncomfortable. There was nasal turbinated edema and pallor, grade III. Cardiac apex 9.5 cm. in the fifth left interspace. Heart sounds were rhythmical without murmurs. There were wheezes and coarse bronchial rales, grade IV. Peripheral arteries were consistent with age. The liver edge was not palpable and there was no peripheral edema. Venous pressure 8 cm. Circulation time 23 sec. Vital capacity 2.2 liters or 48%. ECG—Essentially normal except for an occasional extra ventricular systole. This man died with apoplexy. Post-mortem not permitted.

This paper is primarily directed at understanding the mechanism in cardio-respiratory disease. This information is a prerequisite to rationally directed treatment.

Treatment of the evolving tracho-bronchial and lung disease is the first consideration. Expectorants, anti-spasmotics and anti-biotics plus rest are important. At times it is necessary to remove the patient from exposure to dust. If and when pulmonary heart disease has developed all the armamentarium for treatment of congestive heart failure is applicable—digitalis, salt restriction, diuretics, oxygen, and strict rest.

McMichael, J.,[9] studied the effect of digoxin in individuals with emphysema and right sided heart failure. He reported a fall in cardiac output coincident

to fall in systemic venous pressure. This decrease in pulmonary blood flow was diametrically opposite to the effects sought to improve the emphysematous patient. Ferrer, M. I., and Cournand, A.,[10] reports just the opposite effect of Digoxin with an improvement of pulmonary blood flow and clinical improvement of pulmonary patients in congestive failure. Clinical observation tends to confirm the experimental work of the latter authors.

SUMMARY

The detail study of the cardiac silhouette, ECG, venous pressure, circulation time and vital capacity in cardio-respiratory problems will clarify in a very revealing way the mechanism involved in individual cases. This in turn will allow for more exact prognosis and properly directed treatment.

Individual heart chamber enlargement reflects the burden of work load. The ECG will record hypertrophy and strain patterns.

In right sided heart failure evolving from chronic lung pathology there is an early increase in systemic venous pressure and this is particularly evident in response to exercise. The circulation time is not proportionately increased. This is in contrast to primary left sided failure where back pressure, pulmonary hypertension and consequent right sided failure must precede any increase in systemic venous pressure. Consequently, there is an early increase in circulation time and a delayed increase in systemic venous pressure in primary left sided heart failure.

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A Practical Method Of Intra-Arterial Transfusion

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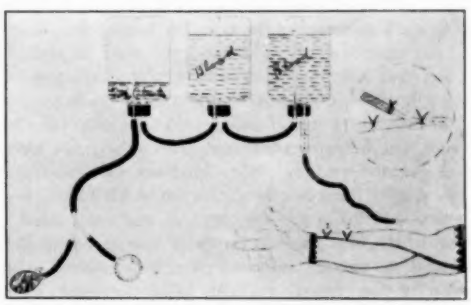
It is impossible to estimate the limitations imposed upon therapy by the physiologic syndrome known as SHOCK. Our earliest principal evidence of SHOCK is the appearance of a subnormal blood pressure, meaning a lowered circulating blood volume. Experience has shown that this physiologic state must be drastically altered by a restoration of blood pressure to within the normal limits during a relatively short period of time or the intensity of the shock will increase to a point of becoming irreversible. Death, either suddenly or after a period of hours is the result of unsuccessfully treated shock. Many cases of mild shock are regularly treated successfully by the use of vasoconstrictor drugs, cardiac and respiratory stimulants and/or intravenous injection of small amounts of crystaloid solutions, plasma or blood. On the other hand, the instance of severe shock due to hemorrhage, either from an open artery or into dilated splanchnic vessels, intra-arterial transfusion is life saving. The added strain on the heart of trying to pump the blood from a large intravenous transfusion is probably often too great a burden for the anoxic heart muscles. By introducing blood into the arterial system under a pressure of 110 millimeters of mercury, tissue perfusion of vital structures is almost immediately attained. This pressure backing up blood in the arterial tree and forcing it through the coronary arteries immediately increases myocardial nutrition and oxygenation, thus returning its function toward normal. Likewise, vital brain centers have their abilities to function improved and also the blood flow through all organs is increased; that of the lungs, kidneys and liver being particularly important in the instance of an anesthetic intoxication, since they will help the body elimination of toxic doses. Not only may the blood pressure be rapidly returned to normal, but also blood volume is restored in this manner. Pressure transfusion intra-arterially can introduce as much as 1000 cc. in approximately 10 minutes.

To date, apparatus for intra-arterial transfusion has been very cumbersome.[2&3] Dr. Coppedge[1] of the Ochsner Clinic published a method of intravenous pressure transfusion with a B. D. blood pressure bulb and the ordinary Baxter blood transfusion bottle. It was thought that adding the aneroid blood pressure manometer to the pressure line with a Y tube, the same apparatus might be used for arterial transfusion. This system was effective but because of only a small air volume the blood in the transfusovac bottle, the pressure fluctuated sharply with each pump of the air intake bulb. By adding an unused transfusovac in tandem to the bottle of blood to serve as air reservoir, an even pressure could be maintained in the transfusing system. In order to keep the transfusion going continuously, a second bottle of blood was added to the line. When the first bottle of blood in the system is emptied, the connecting tubes can be clamped and a fresh bottle of blood or plasma added to the line without interruption of the flow of blood into the patient's artery. If the air pressure exerted in this added bottle of blood is brought up to 110 mm. of mercury before opening the clamp on the tubing leading into the second bottle of blood, the blood will continue to flow without any practical fluctuation in rate.

Our simple apparatus consists of a B. D. blood pressure manometer and bulb, one Y tube, five 16 gauge needles and one blood filter connected by rubber tubing to a #15 silver canula. A sterile packet is maintained in the operating room containing the items enumerated except for the bulb and manometer, which are detached from a B. D. blood pressure apparatus on a moment's notice. Referring to the accompanying diagram, the following instructions are given: (Refer to accompanying diagram).



Detach the B. D. bulb and manometer from the blood pressure instrument, placing them in their indicated respective positions. Connect the Y tube to the empty transfusovac by forcing the needle into the glass air vent tube through the rubber stopper. Join succeeding bottles as illustrated by inserting needles connected by rubber tubing through the

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thick rubber stopper of the first and into the glass vent of the next. Insert the glass blood filter tube into the last blood flask and carefully fill with blood. The filter and attached tubing must be completely filled in order to not force air into the artery through the canula. Under local anesthesia a longitudinal incision one inch long over the radial artery and one inch above the radial styloid is made. The artery is dissected out bluntly. A ligature is tied about the artery in the distal portion of the wound. Another ligature, which is not tied is placed about the artery in the proximal portion of the wound. Half sever the artery and insert the canula, with the tip pointing toward the heart and tie the canula in place by the ligature placed in the proximal part of the incision. Allow the blood to flow, maintaining pressure with the intake bulb between 100 to 110 millimeters of mercury. Care must be taken not to let fluid become exhausted and force air into the artery. If patient is in severe shock, blood will pour through the filter, sometimes as fast as 500 cc. in approximately five minutes. As the blood pressure approaches normal, the blood will flow through the filter at a steady drip or cease. In order to keep the canula clear, force a few drops of blood through it every few seconds. Up to 4000 cc. of blood have been given during an operation with this method.

For obvious reasons, to prevent reactions from blood incompatibilities, we have transfused only identical donor-recipient blood type and irradiated plasma intra-arterially, but if nothing else is available, small amounts of crystaloid solutions could be used beneficially until blood or plasma is obtained.

Examples of the effectiveness of intra-arterial transfusions can be shown by four recent cases:

CASE I

A 30 year old white male with a bleeding peptic ulcer had been transfused many times over a period of a week in an effort to raise his hemoglobin above 50 per cent. He had refused surgery until he realized that blood loss was as rapid as it was given. He was taken to the operating room while intravenous glucose and two blood transfusions were running into his veins. On being anesthetized with ether, his blood pressure dropped to 50/0. Intra-arterial transfusion was started immediately and restored his blood pressure to 110/70 in five minutes and was maintained at this level. The surgeon, without undue haste, performed a gastric resection and anastamosis after securing the bleeding point in a duodenal ulcer. 1500 cc. of blood was given intra-arterially and 1000 cc. intravenously while the patient was on the operating table. The patient returned to his bed with blood pressure of 130/75 as opposed to 110/60 before operation. He maintained this blood pressure and had an uneventful convalescence except for a prolonged wound healing.

CASE II

A middle aged Negro required a resection of one of the metatarsal bones. He was considered to be in good physical condition. A spinal anesthetic 150 mgm. of novocaine was carefully placed in the dural sac without a bloody tap occurring. The patient immediately went into severe shock. The blood pressure was unobtainable, respiratory and complete circulatory collapse was evident. Fifteen minutes later, in spite of artificial respiration with an oxygen mask and the usual emergency therapy of caffeine, adrenalin, coramine and intravenous fluids, the patient had only faint heart sounds present and no blood pressure could be measured. An intra-arterial infusion of plasma was started under pressure and the patient immediately began respiratory efforts. His blood pressure rose to 90/50 at the end of half an hour. At the end of an hour and a half, patient had received 2000 cc. of irradiated plasma into his artery by the same method as described for the use of blood in intra-arterial transfusion. He became conscious and the blood pressure returned to normal with good heart action. The patient was returned to the bed in good condition. Several days later the operation was performed successfully with a different anesthetic agent.

CASE III

A 50 year old white male suffering from a severe case of chronic bronchiectasis required resection of the left lung. The procedure was being done under intra-tracheal anesthesia. An arterial transfusion set was in readiness with the artery exposed, when the patient, in apparently good condition, began to have a cardiac ventricular fibrillation. Arterial transfusion was started immediately and maintained at 110 millimeters of pressure. Respiratory efforts were aided by bag compression to keep the blood oxygenated. Intrapericardial procaine, intravenous quinidine and coramine were given at intervals in an effort to restore rate and rhythm. During this time the surgeon was using cardiac massage within the chest. In 30 minutes the heart was beating at intervals, regularly but too weakly to be effective and without warning would return to fibrillation. One hour and fifteen minutes after the onset of fibrillation, arterial transfusion was still maintaining the usual signs of life. There was no pupil dilatation and respiratory efforts were still in evidence. The heart was now beating rhythmically, but with no force. The incision in the thorax was closed in layers. One and one-half hours after onset of fibrillation, the pupils dilated and respiratory efforts ceased. 2000 cc. of blood were given intra-arterially during this one and one half hour period of frequent ventricular fibrillation.

CASE IV

A 33 year old white male with a lye stricture of the esophagus and stomach, who had been acutely ill for three months, was being explored for the purpose of an esophageal-gastric resection. Dissection of

the esophagus, because of inflammatory tissue reaction, was bloody. The thoraco-abdominal incision was extensive. During the operation, approximately 45 minutes after it had begun, patient's blood pressure fell and was being maintained at 90/40 with difficulty. Arterial transfusion was started and the blood pressure was maintained at 110 millimeters of mercury, throughout a five and a half hour procedure with 1500 cc. of blood. At the conclusion of the operation the patient was in fair condition. He survived for two weeks after the operation and died of a foul empyema, the result of a slough of the upper end of the esophagus.

DISCUSSION

Intra-arterial transfusion should be employed only in severe emergencies in selected cases. Although profound shock which doesn't respond to any medical treatment is always a positive indication, the procedure works most dramatically in cases of good cardiac reserve which have had acute blood loss.

Ligation of the radial artery probably carries a percentage of risk of ischemic necrosis, which as yet has not been entirely explained. We know that between two to five percent of hands do not have the normal radio-ulnar arterial anastamosis. One writer suggested occlusion of the radial artery by thumb pressure before any operation as a possible test for this anomaly. Another thought on the etiology of ischemic gangrene that occasionally occurs is that infusion of unoxygenated blood into the arm over a sufficiently long period of time may act like a tourniquet; however, it must be remembered that most intra-arterial transfusions flow rapidly for a short period only, then, as needed, in smaller amounts. Cold blood in the radial artery may cause a reflex vaso-spasm of the brachial artery according to one author and he recommends local novocaine infiltration as a possible aid in preventing the spasm when inserting the canula into the artery. Some writers suggest the practicability of using an arterial transfusion to perform a bloodless operation. For example, in brain surgery, hemostasis is sometimes very difficult. Under anesthesia a phlebotomy could be done, allowing the blood pressure to drop to 90/60. Here the pressure would be maintained by a manometer forcing the blood back into the artery after it was citrated as indicated. Before closing, by raising the blood pressure to normal levels, bleeding points would show and could be secured. Finally, all the blood would be returned by intravenous route when the operation was concluded.

SUMMARY

A simple apparatus for intra-arterial transfusion is described and indications for its use. Four illustrating cases are presented. Possible sequellae of ischemic necrosis of the hand is discussed.

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The Clinical Significance Of Foreign Body Granulomas: A Review

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PART 2

Schistosomiasis.—One of the most important of parasitic diseases is caused by the blood fluke, Schistosomum hematobium. The disease is prevalent in North and South Africa, especially in Egypt but also in the Sudan, Ethiopia, the Congo and Rhodesia, as well as in Arabia, Persia, the west coast of India, Madagascar, Puerto Rico and occasionally in Australia and the United States. In some countries, schistosomiasis causes more sickness and death than any other single disease. It has been estimated, for example, that six million of the twelve million inhabitants of rural Egypt are infested with S. hematobium and three million with S. Mansoni and that at least one and a half million are infested with both species together.[17] Until the year 1926 Cutler [18] was able to collect reports of only twenty-two cases of schistosomiasis occurring in the United States and Canada. However, that the incidence of the disease is apparently increasing in North America is indicated by the fact that since 1933 five cases of schistosomiasis have been subjected to necropsy at Bellevue Hospital alone (Symmers).[19] All of them occurred in Puerto Ricans or in Latin Americans. In two cases the livers showed the naked eye changes of atrophic cirrhosis. Microscopic examination of the liver revealed marked overgrowth of connective tissue in the periportal spaces where it not only surrounded but invaded the lobules, dividing them into smaller islands of cells. In occasional instances, individual liver cells were surrounded by connective tissue in much the same fashion as in the pericellular cirrhosis of congenital syphilis. Lying in the parenchyma were variable numbers of granulomas containing ova. Some of the ova were well preserved, others were in different stages of disintegration, while still others were calcified. The histology of the granulomas varies considerably. In some of them the ova are centrally placed and are partially or almost completely surrounded by multinuclear foreign body giant cells of the Langhans type together with variable numbers of lymphocytes, plasma cells, eosinophiles and polynuclear neutrophiles, while at the extreme periphery there are sometimes numbers of circumferentially arranged epithelioid cells, the whole resembling the exudative tubercle in the early stages of repair. In still other instances, the tubercle-like bodies show one or more ova and are practically completely converted into localized collections of poorly cellular fibrous tissue; in other words, the granulomas are apparently healed.

Xanthoma.—The condition known as xanthoma palpebrarum occurs, as its name implies, in the eyelids. It is not uncommon in elderly individuals and is occasionally seen in subjects of diabetes mellitus. On the other hand, the lesion that is called xanthoma diabeticorum is specific and occurs only in patients with diabetes mellitus. In xanthoma palpebrarum the growths are usually multiple, irregular in outline, yellowish in color, slightly elevated above the surrounding skin and are confined, as a rule to the upper or lower eyelids on one or both sides. In xanthoma diabeticorum the growths show a predilection for the regions of the elbows, knees and buttocks. They occur as firm, rounded or oval papules, the apices of which are yellowish and bear a superficial resemblance to pustules, while the bases are pinkish. Still another variety of nodule is known as xanthoma tuberosum multiplex. It occurs in the form of lesions varying from papules to tumor-like growths measuring many centimeters in diameter. According to Rigdon and Willeford,[20] 18 cases of sudden death have been recorded in children 16 years of age or younger with xanthoma tuberosum multiplex attended by arterial sclerosis. The most frequent cause of death was coronary occlusion. In a case reported by them, atheromatous plaques were present in the aorta and in the coronary, carotid, innominate and subclavian arteries of a boy 12 years of age in whom xanthomas were located on the extensor surfaces of the right arm, in the subcutaneous tissue of the left arm, in the region of the left elbow and of the corresponding knee and in both buttocks. In all of these three forms of xanthoma, the histologic changes are much the same and are characterized by diffuse overgrowth of connective tissue among which are multinuclear giant cells containing lipoid material.

That form of xanthomatosis which constitutes the Hand-Schüller-Christian syndrome is encountered most often in children and in males more commonly than in females. The principal changes consist of defects in the membranous bones of the skull, exophthalmus, diabetes insipidus, and dwarfism. Nodules occur in the bones at the base of the skull, sometimes penetrating to the meninges or perforating the skin. Identical nodular formations in the retro-bulbar tissues are responsible for the exophthalmus and for diabetes insipidus, the latter following pressure on the hypothalamus. In addition, characteristic nodules may be encountered in the mediastinum, the omentum, the adrenals, kidneys, heart, lymph nodes, spleen and liver. Histologically, the nodules are composed of

mature or fibroblastic connective tissue and foreign body giant cells containing lipoid material. In the later stages, the growths are almost completely converted into fibrous tissue.

Histoplasmosis.—The disease known as histoplasmosis was first described by Darling in the Panama Canal Zone. He identified the causative agent as histoplasma capsulatum. The organism, a species of fungus found in soil, measures from 3 to 5 microns in diameter and contains a round or crescent-shaped, central basophilic body surrounding which there is a clear zone and a refractile capsule. The disease is by no means limited to the tropics but has been described in various parts of the world. During the past decade it has been found to occur widely in the United States, where cases have been observed in Minnesota, California, Iowa, Tennessee, Ohio, Missouri, Mississippi, Maryland, Virginia, Kentucky, Florida, Indiana, Alabama, Texas, Illinois, Washington, D. C., Oklahoma, Louisiana, New York and North Carolina. Parsons and Zarafonetis[21] encountered nine cases originating in the State of Michigan alone in the interval of 25 months between November 1938 and December 1940. In view of the fact that histoplasmosis may be easily overlooked or misinterpreted, it is probable that it is even commoner than at present suspected. Any age group may be affected but the disease most frequently occurs in males in early life. Clinically, histoplasmosis is manifest in the form of ulcerative lesions of the skin and in the mucous membranes of the mouth, pharynx and intestine, or it may be generalized. Although frequently fatal, recovery is believed to occur, as shown in individuals with cicatrized or calcified pulmonary lesions resembling those of healed tuberculosis. The lesions in histoplasmosis are nodular and vary in size from a few millimeters to one or more centimeters. Histologically, they consist of necrotic centers surrounded by fibroblasts, lymphocytes and parasitized large mononuclear cells. In the more prolonged cases, granulomas may occur in various organs and in them multinuclear giant cells contain variable numbers of the causative organism.

Granulomas of Torulosis.—There is an ill-defined group of pathogenic yeast-like species of fungi listed under the genus Torula, in which the organisms do not produce mycelia or endospores but multiply only by the process of budding. Clinically, the organisms often express a predilection for the central nervous system where they sometimes produce symptoms that are suggestive of a new growth or of encephalitis. Similar lesions may occur in the lungs, liver, spleen and kidneys. In man a frequent atrium of infection appears to be in the respiratory tract. Histologically, the torula granuloma is composed of an infiltrate of large mononuclear and plasma cells together with multinuclear giant cells containing spherical foreign bodies or torulae measuring from 1 to 10 micra in diameter.

Pin Worm Granulomas. — Oxyuris vermicularis, otherwise known as the thread, pin or seat worm, is extremely common and its favorite habitat is the colon and rectum. The male measures about 4 mms. in length and the female about 10 mms. The female, which is the more frequent offender, causes intense itching, especially during the nematode's nocturnal peregrinations. From its abode in the intestine, the worm often migrates into the vagina along which it passes to the endometrium, thence through the Fallopian tube to the surface of the adjacent peritoneum. In all of these localities, with the apparent exception of the vagina, it may produce tubercle-like foreign body granulomas composed of lymphocytes, epithelioid and giant cells, the latter arranged in apposition to particles of chitinous material that remain in the tissues following death and dissolution of the parasite. In addition to the localities mentioned, the pin worm frequently invades the appendix where it penetrates the submucosa and initiates granulomas of the foreign body type,[22] or it may allow infective microorganisms to follow its path and to set up acute inflammatory lesions.

Pentastoma Granulomas.—Pentastoma denticulatum is the larva of Pentastoma tenoides, a lancet-shaped animal belonging to the tongue worms or Pentastomidae. It inhabits the nasal, frontal and maxillary sinuses of various animals, especially the dog, seldom in man. The female is from 50 to 80 mms. long and the male from 16 to 22 mms. The larva is found chiefly in the liver, lung or spleen, more rarely in the other organs of man and the herbivora. The eggs are taken in from the external world through the intestinal tract. The parasites set free in the intestine wander by means of a boring apparatus through the mesentery into the adjacent lymph nodes or penetrate directly into blood vessels and are carried to the liver or even to the lung where, after moulting they develop into larvae and are encysted. The larvae in their wanderings may gain access to the nasal cavity of their host and develop into mature animals.

The two species of Pentastomidae or linguatulida that are of clinical importance are armillifer armillatus and linguatula serratus. Armillifer armillatus lives in the trachea and lungs of pythons and other African snakes. When the intermediate host is eaten by a snake the nymphs are liberated and penetrate into the lungs where they rapidly develop into adult forms. Man may be infested by drinking water containing the ova deposited either from the sputum or excreta of the snake. Many cases of human infestation have been reported from West Africa, especially the Belgian Congo, and a few cases from the Orient while in North America, apparently only two examples are recorded, both probably due to a species of parasite peculiar to the rattlesnake. Human infestation by armillifer armillatus is sometimes so severe as to occasion illness or even death, (Cannon).[23]

In man infestation by the larvae of linguatula serratus is not uncommon, especially in Germany, Great

Britian, and certain parts of the American Continent. Osler mentions the case of a patient in Missouri who expectorated between 75 and 100 parasites coming, apparently, from a focus of infestation in the liver and a patient in Canada who expelled the same sort of worm in the urine. The larva of linguatula serrata produces localized chronic productive inflammatory lesions characterized by a central area of dead or degenerate parasites surrounded by a layer of epithelioid cells among which foreign body giant cells are formed around amorphous material representing remnants of cuticle shed by the larvae while moulting.[24]

Sporotrichosis.—Sporotrichosis is an ulcerative mycotic lesion which is usually limited to the skin, subcutaneous tissues and superficial lymphatics, especially of the hand and arm, although it may occur in deeper tissues and may even become generalized. The disease follows infection by any one of the several pathogenic species of the genus Sporotrichum. Infection is often attributed to the pricks of thorns and since the disease is encountered in gardeners, florists and those engaged in similar pursuits, it is regarded as an occupational hazard. It is commonest in the United States and in France and Switzerland, although cases have been observed in different parts of South America and Africa. Clinically, the lesions are most commonly those of multiple abscesses that are distributed in linear fashion along the course of the superficial lymphatics. Later the lesions appear as productive granulomas in the multinuclear giant cells of which foreign bodies are present in the form of mycelial remnants.

FOREIGN BODY GRANULOMAS DUE TO INANIMATE SUBSTANCES

Dusting Powder Granulomas.—In reporting the results of an investigation on the pathologic changes produced by the deposition of lycopodium in human tissues, Antopol,[25] in 1933, recorded an incidental case of peritoneal foreign body granulomas due to talcum powder that had been introduced as a dusting powder on surgeons' rubber gloves. His observations have since been confirmed and extended both clinically and experimentally by other investigators to include peritoneal adhesions followed by intestinal obstruction and by foreign body granulomas in the rectum, vagina, cervix, testicle, kidney, breast and brain and in healing wounds, so that the implantation of talcum and other dusting powders may be regarded as a surgical menace. The earliest observations on intra-abdominal complications arising from powder in the peritoneum had to do with the use of lycopodium, a genus of evergreen plant colloquially known as club-moss or wolf foot to the spores of which the peritoneum reacts almost exactly as it does to talcum. The nodular granulomas produced by both forms of dusting powder are characterized, histologically, by a matrix of connective tissue scattered through which are innumerable multinuclear giant cells formed around the brilliantly eosinophilic spores of lycopodium or around crystals of talc.

Foreign Body Granulomas of Pulmonary Arteries.—In the routine examinations of microscopic sections of lungs from necropsies over a period of twenty years, Von Glahn and Hall[26] observed six cases in which foreign bodies were present in the smaller branches of the pulmonary arteries. These foreign particles were slender, had a greenish tinge, did not stain with the dyes customarily employed in histologic examinations and were doubly refractive. The bodies usually lay against the intimal surface of the artery and, in some instances, were embedded in a collection of large mononuclear cells together with multinuclear giant cells of the foreign body type. When the clinical histories of these patients were studied, one feature was common to all: each had received one or more intravenous injections of physiologic saline or glucose solution or blood transfusions within a period of not more than ten days prior to death. The foreign particles were regarded as fragments of cotton that were contained in the injected solution and that had come either from the gauze through which the solution had been filtered, or from the cotton stopper that adhered to the mouth of the flask. The correctness of this impression was borne out by experimental procedures in which cotton was immersed in physiologic salt solution and cut into fragments of such minute size as readily to be drawn into a syringe through a number 19 gauze hypodermic needle. Suitable amounts of material were injected into adult albino rats. The rats were sacrificed at varying intervals and microscopic examination of the smaller pulmonary arteries revealed granulomas of the same sort as those encountered in human subjects. In arteries of medium size, arterioles, and in precapillary branches, the granulomas were found to distend the lumina and often to escape through defects in the walls of the vessels. The defect in the vessel wall was produced by penetration of the cotton fiber through it and by actual tearing of the wall. At first the gap was filled with fibrous tissue; later, smooth muscle and frequently a new elastica interna was formed while the scar was covered by endothelium. The lumen of the vessel was patent. Some of the cotton fibers ultimately came to lie in alveolar spaces and were surrounded by foreign body giant cells. Neither thrombosis nor hemorrhage was associated with the presence of these granulomas nor did the process lead to infarction of the lungs.

Foreign Body Granulomas in Benign Temporal Arteritis.—The disease known as benign temporal arteritis was first described in 1932 by Horton, Magath and Brown.[27] Since that time, Crosby and Wadsworth[28] have collected a total of 48 cases, including 4 of their own. The disease involves not only the temporal artery and its branches, but the retinal and cerebral arteries and may even be generalized, as in the cases recorded by Sproul and by Cooke and others. Clinically, it affects individuals of the older age group and is characterized by local changes consisting of painful and tender, red and swollen, nodular areas

corresponding to the distribution of one or both temporal arteries or their branches, and edema of adjacent structures together with the symptoms of fever, malaise and anorexia, loss of weight and weakness. In those patients with involvement of the retinal arteries, blindness is common, having been found in 33.3% of the 48 cases collected by Crosby and Wadsworth. The cause of the disease is not known but by some it is regarded as a local manifestation of so-called polyarteritis or, better, panarteritis nodosa. Recovery usually ensues. Histologically, the lesions consist of granulomas attended by the irregular distribution of epithelioid cells, lymphocytes and multinuclear giant cells. Some of the giant cells contain vacuoles where, apparently, crystalline substances previously existed and were dissolved in the course of preparing sections for microscopic examination. In still other instances, the giant cells are formed around fragments of degenerate elastic tissue.

Granulomatous Mesaortitis.—In 1937 Sproul and Hawthorne[29] described an apparently unique disease under the title of chronic diffuse mesaortitis. Since then four additional cases have been recorded by Gilmour [30] and one by McMillan.[31] The disease is clinically silent. In the first case described by Sproul and Hawthorne, clinical observers were totally unaware of any damage to the cardiovascular system. The second case presented the picture of progressive cardiac failure but this was due to sclerosis of the coronary arteries and myocardial infarction. Histologically, the lesion, as its name implies, is confined to the media, thus differing from all other known productive diseases of the aorta. It is characterized by a profusion of lymphocytes and plasma cells together with an occasional multinuclear giant cell arranged around fragments of elastic tissue.

Bagasse Disease of the Lungs.—Sugar cane from which the juice has been extracted is called bagasse. The product is broken, processed and pressed into various shapes for insulating building materials. The dust of the dried grass is an industrial hazard. The disease that follows its inhalation is known under the dubious name of bagasse or even more improperly, perhaps, as bagassosis or bagasscosis. Bagasse disease of the lungs is characterized by cough, dyspnea and hemoptysis, night sweats, chills and intermittent fever. Roentgenologic examination of the chest shows mottling of both lungs, resembling that of miliary tuberculosis. The disease commences insidiously. The pulmonary reactions incited by the inhalation of bagasse dust are reversible and complete resolution may occur. Because the disease is seldom fatal, only rare opportunities have thus far been presented to determine the histologic changes in the lungs. Investigations of this sort have been limited to a single necropsy and to the removal of a few particles of tissue for biopsy. The lesions so far described consist of localized pneumonic areas composed of foam cells together with foreign body reaction around bagasse fibers.

The cause of bagasse disease is still obscure. Some investigators believe it is either a fungus or a bacterial infection, the causative agents being introduced on the surface of the inhaled dust. Others contend that it is a virus disease and still others that it is an allergic response to the presence of bagasse material. Gerstl, Tager and Marinaro[32] have approached the subject experimentally and the results are suggestive. Suspensions of five lots of bagasse were administered intravenously, insufflated into the trachea or injected into the skin of rabbits and guinea pigs. Animals receiving intravenous injections of bagasse in suspension showed extensive foci of necrosis and cellular reactions. In addition, the presence of mycelia and spores in the damaged organs served as an indication of the nature of the infective agent. Animals that received injections of autoclaved bagasse revealed only small granulomas in the lungs of the foreign body type. These results suggest that bagasse disease of the lungs is caused by a fungus and that the dust itself is relatively innocuous.

Silica Granulomas.—German[33] has recorded an apparently unique case of foreign body granuloma due to particles of sand. The lesion occurred in a man who fell while mountain-climbing and sustained a laceration of the scalp. The wound was cleansed and healed without further incident until some years later when a nodule appeared in the scar and eventually attained a diameter of 2 cm. Excision and microscopic examination showed a matrix of epithelioid cells arranged in whorls and an occasional multinuclear giant cell in the cytoplasm of which were crystals of silica.

Beryllium Granulomas.—In recent years, beryllium, a light, non-radioactive metal, has been used in the manufacture of x-ray apparatus, radio tubes and fluorescent lamps. The metal is of additional importance because, in some instances, it is capable of inducing acute or chronic pulmonary lesions as well as changes in the skin and subcutaneous tissues. Two forms of pulmonary lesions have been described in beryllium workers: an acute pneumonitis and a chronic form or pulmonary granulomatosis. Acute reactions have been observed only in extraction plants where exposure is largely due to the acid compounds of beryllium, the sulphates and the fluorides. The changes consist of irritation of the upper respiratory tract including the pharynx, trachea and bronchi and occasional cases of acute pulmonary edema, in all of which, however, complete clearing may occur. The chronic phase or pulmonary granulomatosis of beryllium workers commences insidiously and is characterized clinically by shortness of breath, cough, rapid pulse and loss of weight. In some instances the onset may be delayed, cases having been described in which symptoms and signs were postponed as long as five years after exposure to beryllium. Of five cases of beryllium pulmonary granulomatosis described by Slavin,[34] one of the patients had been employed in

removing insulating materials from copper wires by means of, revolving steel wire brushes. Some of the small copper wires were made of an alloy containing beryllium. The patient was not protected against inhaling the dust scattered by the brushes. Death occurred and necropsy revealed numerous discrete nodules scattered throughout the lungs. On microscopic examination the nodules were found to consist of small granulomas in which the changes resembled those of Boeck's sarcoid. The fibrous elements in the granulomas were concentrically arranged around multinuclear giant cells containing deposits of metallic beryllium. The four remaining patients in the series described by Slavin also worked on radio tubes. Three of them are still living (1949). A fifth patient died but necropsy was not obtained. Histologically identical granulomatous lesions occurring in the skin and subcutaneous tissues as a result of lacerations by fluorescent light bulbs have been described by Grier, Nash and Freiman[35] and others.

Riedel's Struma.—The disease known as Riedel's struma, struma fibrosa, ligneous thyroid and iron-hard struma is a chronic productive inflammatory lesion of the thyroid which occurs most frequently in males in the fourth and fifth decades of life. The cause is unknown. Clinically, the thyroid presents an ill-defined area of induration involving one or both sides of the gland and the growth is firm, nodular, painless and often adherent to surrounding structures. Microscopic examination reveals that the area of induration is due to diffuse overgrowth of mature or moderately cellular connective tissue in which localized foreign body granulomas are sometimes formed around masses of degenerate colloid material. The consensus seems to be that Riedel's struma is an independent disease of the thyroid, bearing no relationship, for example, to Hashimoto's struma lymphomatosa, although the opinion has been expressed that the two are different stages of the same disease. In the case described by St. George,[36] the growth was excised from his own body and in the course of removal the recurrent laryngeal nerve was injured and the patient was left with partial paralysis of one vocal cord and permanent partial aphonia.

Granulomas in Gout.—The nodular lesions which characterize gout may occur in almost any connective tissue in the body, but are most frequently located in and around joints, especially the metatarso-phalangeal joints, in ligaments, tendons and tendon sheaths and in bursae or, as the so-called tophus that is most commonly seen in the helix of the cartilaginous external ear. The nodules vary in size from those which are relatively negligible to large growths that sometimes penetrate the skin, forming indolent ulcers, particularly around the small joints of the fingers and toes. Histologically, the nodule in gout is a foreign body granuloma scattered through which are variable numbers of multinuclear giant cells arranged in apposition to delicate, needle-like crystals of sodium biurate.

Non-Specific Granulomatous Prostatitis.—Under the heading of granulomatous prostatitis, Tanner and McDonald,[37] in 1943, described a localized lesion attended by desquamation of the epithelial lining of the prostatic ducts or acini followed by the escape of secretion into the surrounding tissues and the formation of granulomas characterized, histologically, by collections of epithelioid histiocytes with or without the presence of multinuclear giant cells, some of the latter arranged around the remains of disintegrated corpora amylacea. More recently, Symmers,[38] using the title of non-specific granulomatous prostatitis, described identical localized formations in the prostate and, in addition, similar but diffuse inflammatory lesions scattered throughout the substance of the organ. In many instances the changes in both the localized and diffuse varieties of granuloma resembled those of epithelioid tubercles.

Intra-dermal Typhoid Vaccine Granulomas. — In 1943 Tilden and Arnold[39] encountered six cases of foreign body granuloma following the intra-dermal injection of triple typhoid vaccine. The lesions occurred at the site of injection in the form of small, shot-like, reddish nodules. Microscopic examination showed a necrotic center surrounded by a zone of histiocytes among which were multinuclear giant cells formed, presumably, around the bodies of dead bacteria.

"Paraffinoma".—The individual who, rather than accept the inevitable, causes or allows paraffin to be injected beneath the skin under the promise or hope of restoring the appearance of youth, is more apt to find that such injections are followed by distressing disfigurement. The results are sometimes so disturbing as to lead to death by suicide. Histologically, the lesions are those of granulomas which eventually become fibrotic or even hyalinized and in which multinuclear giant cells are formed around particles of infiltrated wax.

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CANCER

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THE MEDICAL COLLEGE CANCER CLINIC

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Since January, 1950 eleven papers on the subject of cancer have appeared in this section of the Journal of the South Carolina Medical Association. This, the twelfth paper, is intended to close the first series. It would, therefore, seem appropriate to report on the activities of the Medical College Cancer Clinic in this final article.

This particular clinic has three primary purposes: the diagnosis and treatment of patients with cancer, the teaching of cancer subjects to various groups and the performance and encouragement of research related to cancer. In the former of these functions, the clinic is the same as the seven other state aided cancer clinics in South Carolina. In the latter two functions, however, a considerably more extensive program exists. The educational and research programs rightly involve an appreciable expenditure of time and funds.

The Cancer Clinic is open to patients five mornings of the week. An attempt is made to see the new patients on specific days and the patients returning for re-examination on others. Further, the return patients are grouped into a number of subdivisions, such as gynecology, gastroenterology, etc., and channeled into certain days. This not only enhances teaching but permits consultants to see more patients in their particular field of interest in fewer visits to the clinic, a matter of practical importance.

As will be seen on the two maps indicating the county of origin of new patients for 1949 and 1950, the majority of these patients come from Charleston County and the surrounding eight counties known as the Coastal District. From the other counties, a number of patients are received, usually for some type of treatment not available in the other clinics, such as radioactive isotope therapy. In spite of the distance a considerable number of the patients must travel to the clinic, attendance has been remarkably faithful. Of the new patients 85 per cent kept their first appointment. For the return visits, patients did less well but the finding that 78 per cent of the appointments were kept is excellent in view of the fact that many of these patients feel perfectly well and understand poorly the necessity of frequent re-examination. Admittedly, considerable emphasis is given to the importance of follow-up visits and much secretarial and visiting nurse time and effort are expended on the follow-up program.

Table 1 shows an analysis of the clinic visits for the years 1949 and 1950. During the latter year 1,190 patients were seen for a total of 4,438 visits to the clinic. Of this group, 198 died and 311 were discharged because of the absence of malignancy, or were dropped by reason of transfer to another clinic, moving from the state, etc. A total case load of 681 patients remained at the end of the year.

A comparison of the past two years is of some interest. A 32 per cent increase in total visits is noted. There was a 25 per cent increase in the number of new patients seen. In 1949, however, 55 per cent of

Table 1

CANCER CLINIC PATIENTS

	1949	1950
Old Patients	305	507
New Patients	545	683
Total	850	1,190
Died	149	198
Discharged	225	311
Total	343	509
Total remaining December 31, 1950	507	681
Malignant	525 (new 288)	719 (new 312)
Non-malignant	314 (new 236)	450 (new 330)
Undiagnosed	28 (new 21)	49 (new 38)
Total	867	1,218
More than 1 malignancy	17	28
Total	850	1,190
Total number of visits	3,368	4,438

Table 2

HOSPITAL ADMISSIONS

	No. admissions		No. hospital days	
	1949	1950	1949	1950
Remaining December 31			375	574
January	42	61	788	1045
February	33	49	394	897
March	34	54	442	1104
April	34	60	401	1147
May	37	66	399	1212
June	29	44	459	1113
July	43	58	887	899
August	41	60	654	1384
September	41	46	703	730
October	43	57	806	826
November	46	52	724	798
December	46	37	482	388
Total	469	644	7504	12117

the new patients were diagnosed as having a malignancy, whereas this decreased to 49 per cent in 1950. Stated differently, the increased number of new patients seen shows a definite trend when it is found that there was an 8 per cent increase in new patients with a malignancy compared to a 40 per cent increase in new patients diagnosed as having no malignancy. This increased utilization of the Cancer Clinic facilities for diagnostic services is most desirable from the standpoint of student teaching, early diagnosis and lay education, but presents a serious problem with regard to the financial drain on funds intended for patients with malignancy. Whereas in many cases, a diagnosis of benign disease can be made with relative ease, some patients require hospitalization, intensive study and even operation for accurate differentiation. Even with the greatest care, occasional malignant lesions may be missed.

Table 2 shows the hospital admissions and the number of hospital days care given these patients. It would be of considerable interest if the patients hospitalized could be grouped into: those with benign lesions, those admitted for terminal care only, those who had only palliative therapy and those whose treatment resulted in reasonable hope of cure. Such a study is now being carried out.

During the year 1950, there was an average of almost two hospital admissions per day. The average length of hospitalization for these patients was 18.8 days, compared to an average hospital stay of 16.0 days for 1949.

Table 3 shows the incidence of various types of malignancy in this clinic. The skin lesions were, of course, mainly in white patients and is the one group in which the white patients decidedly outnumbered the colored. The increased number of patients with carcinoma of the lung is of interest. It has been noted previously that carcinoma of the esophagus was unusually frequent in this clinic, and the incidence these past two years bears this out. As will be noted, more malignant lesions of the esophagus were seen than stomach or colon and rectum. Another point of interest is that nearly as many women as men had carcinoma of the esophagus, whereas in most large series the frequency is much greater in men. A similar discrepancy was noted in the colon and rectum group, where there were considerably more women than men, and in most series the sex distribution is about equal or shows a greater frequency in men. Carcinoma of the cervix is the malignancy seen most frequently in this clinic. The incidence is particularly high in comparison to the number of women seen with carcinoma of the fundus of the uterus. Very few malignant tumors of the ovary are seen. The increased number of patients with leukemia and the lymphoma group is perhaps due to the fact that radioactive isotopes and the newer chemotherapeutic agents have been available at this clinic.

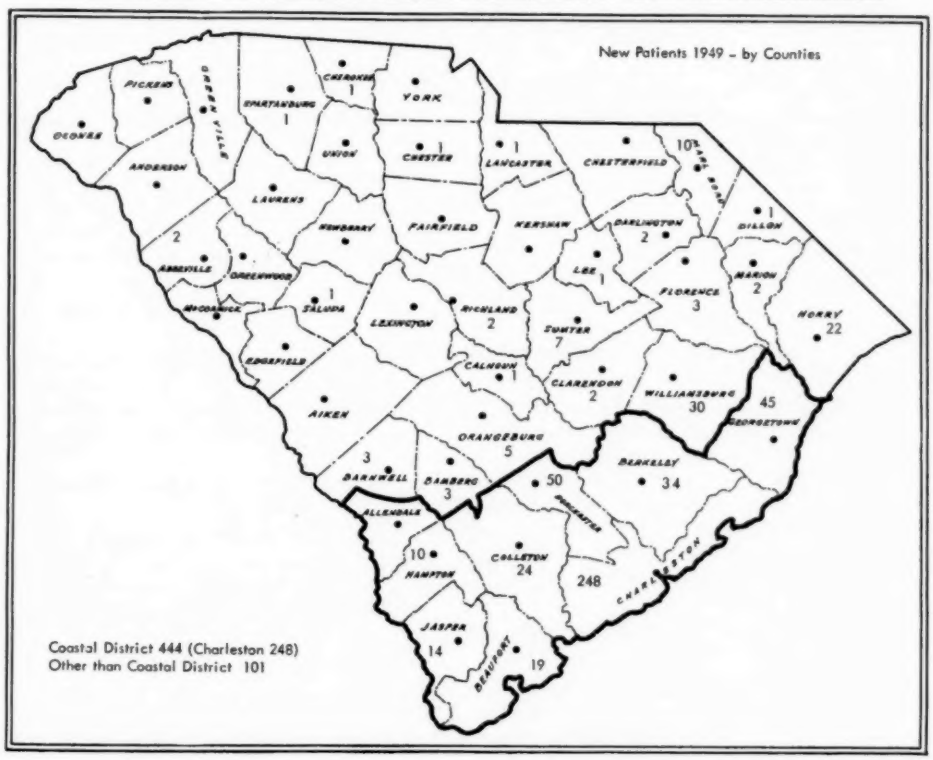
SUMMARY

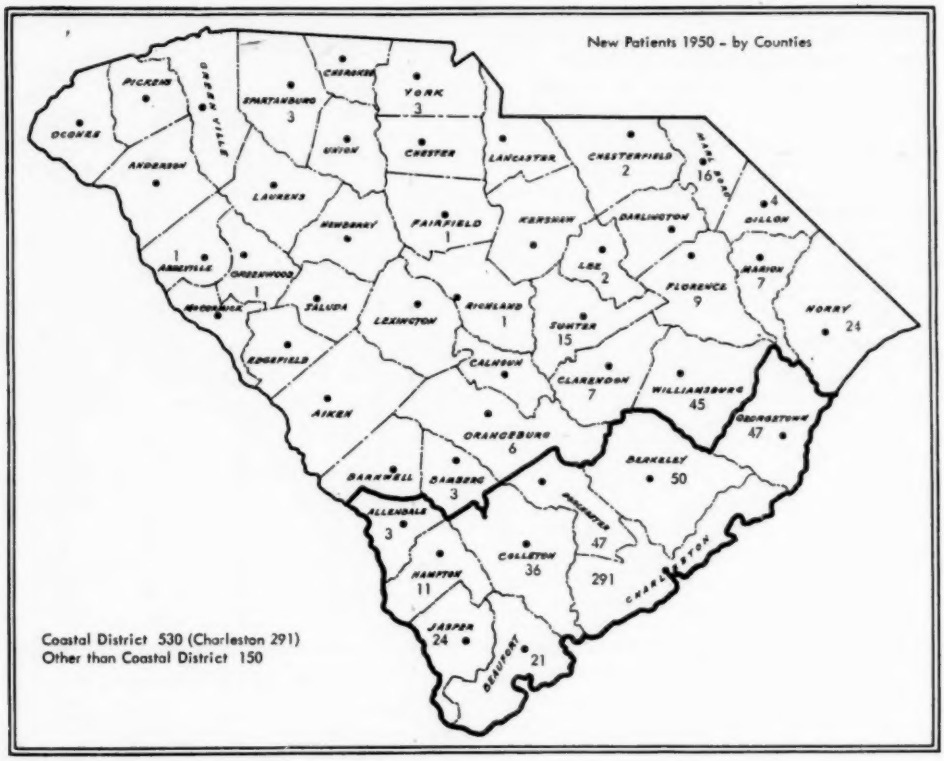
From the above, some concept of the magnitude of providing facilities for the diagnosis and treatment of indigent patients with cancer can be obtained. During 1950, from a total group of 1,190 patients, 644 required hospitalization, totalling 12,117 hospital days. In addition, obviously, a large number of patients received all or part of their treatment as outpatients. The nature and objective of the treatment given, the unusual incidence of some of the lesions, the stage of certain malignancies and a number of other points suggest problems worthy of more detailed analysis as a larger group is accumulated.

Table 3

INCIDENCE OF VARIOUS TYPES OF MALIGNANCY

	1949				1950			
	New	Total	M	F	New	Total	M	F
Skin	42	84	40	44	40	123	63	60
Lip	4	13	9	4	7	20	15	5
Oral cavity	12	23	11	12	16	27	16	11
Pharynx	4	7	4	3	5	5	4	1
Larynx	3	4	3	1	4	8	6	2
Lung	4	11	10	1	13	18	15	3
Thyroid	4	5	1	4	5	10	2	8
Breast	28	58	1	57	32	80		80
Esophagus	20	30	17	13	15	25	12	13
Stomach	13	20	13	7	14	29	23	6
Colon & rectum	17	24	9	15	13	31	9	22
Cervix	88	154		154	70	191		191
Fundus uteri	1	2		2	2	4		4
Ovary	3	4		4	2	6		6
Vagina	2	2		2	2	5		5
Vulva	3	6		6	4	8		8
Prostate	5	6	6		15	21	21	
Penis	7	14	14		7	17	17	
Bladder	7	10	5	5	5	10	3	7
Kidney	2	3	3		3	5	3	2
Leukemia	5	7	5	2	15	19	10	9
Lymphosarcoma	1	7	7		3	5	3	2
Hodgkin's	1	4	4		2	6	5	1
Other	22	27	15	12	28	46	29	17
Total	298	525	177	348	321	719	258	461




New Patients 1950 – by Counties
OCONEE
PICKENS
GREENVILLE
ANDERSON
SPARTANBURG
3
CHEROKEE
YORK
3
UNION
CHESTER
LANCASTER
CHESTERFIELD
2
MARLBORO
16
LAURENS
NEWBERRY
FAIRFIELD
1
KERSHAW
DARLINGTON
DILLON
4
ABBEVILLE
1
GREENWOOD
1
SALUDA
LEXINGTON
RICHLAND
1
SUMTER
15
LEE
2
FLORENCE
9
MARION
7
HORRY
24
EDGEFIELD
CALHOUN
CLARENDON
7
WILLIAMSBURG
45
GEORGETOWN
47
AIKEN
ORANGEBURG
6
BARNWELL
BAMBERG
3
BERKELEY
50
ALLENDALE
3
47
COLLETON
36
291
CHARLESTON
HAMPTON
11
JASPER
24
BEAUFORT
21
Coastal District 530 (Charleston 291)
Other than Coastal District 150

TEN POINT PROGRAM
OF THE
SOUTH CAROLINA MEDICAL ASSOCIATION

1. Cooperation

To promote closer cooperation and better understanding between all agencies, groups and individuals concerned with providing and improving medical care for the people of South Carolina.

2. Extension of Medical Care

To study constantly the need and availability of medical care in each county of the State and in the State at large.

To promote plans for providing or improving medical care where is a need, particularly in the rural areas.

3. Pre-Paid Hospital and Medical Care

To make voluntary pre-paid hospital and sickness insurance available to all the people of the State (through Blue Cross, Blue Shield, and commercial insurance policies), and to promote the widespread purchase of such insurance.

4. Care of Indigent

To work with local county and state agencies, and with philanthropic organizations, toward securing good medical care for the indigent.

5. Public Health

To support the South Carolina State Board of Health in its broad program of preventing diseases and of safeguarding the health of our people.

6. Health Councils

To support the State Health Council in its announced program. To sponsor the formation of a County Health Council in every county of the state, and to encourage our members to support and to work with these organizations.

7. Hospitals

To promote the expansion of present hospital facilities and the building of new hospitals—where there is a definite need.

To strive for highest standards of professional care in the hospitals in the State.

8. Medical Colleges

To support the Medical College of the State of South Carolina and to bend our efforts toward keeping its standards of education on a par with other medical colleges throughout the country.

To promote good nursing education and good nursing care throughout the State.

9. Education of the Public

To acquaint the citizens of the State with regard to the problems of medical care in existence today, to inform them as to what is being done to solve these problems, and to advise with them as to further plans for securing better health and better medical care for the people of South Carolina.

10. Political Medicine

To prevent political control or domination of medical practice or of medical education.

The Journal of the South Carolina Medical Association

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Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Original manuscripts, subject to approval by the Editor and the Editorial Board, are desired for publication in the Journal. They should be typewritten, double spaced, on 8½ x 11 paper. References should be complete, and only such as relate directly to statements quoted in the paper. Illustrations will be used as funds permit, or as authors are willing to bear the necessary increase in cost. Short original articles are preferred to long reviews.

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FEBRUARY, 1951

TO GIVE OR NOT TO GIVE

It is our considered opinion that the practicing physician of today must not only consider the desirability of giving one of the sulfonamides or antibiotics to the patient under his care, but that he should weigh just as carefully the reasons for not giving one of these preparations.

The winter season, with its crop of respiratory infections, is the time when these drugs are prescribed most extensively, and this winter has seen the greatest use of these agents ever. The causes are obvious; they are easy to give, they are relatively safe, the cost is no longer prohibitive, they are the newest weapons in the doctor's armamentarium, and the public expect—at times, insists—that they be given.

That these drugs are doing much good in many cases is certainly true, that they may also be doing harm in numbers of cases is also true, in our opinion. Unwarranted or indiscriminate giving of the sulfonamides and antibiotics at the beginning of every respiratory infection or in the course of an ordinary common cold is to be deplored.

It may render the patient sensitive to a particular drug and render its use at a later time, when it is truly indicated, undesirable; in certain cases, it makes the normal bacteria (and viruses?) of the nose and throat drug-resistant; it tends to cut short the building up of antibodies within the patient which might be of significant value in protecting the patient against subsequent infections.

The practicing physician who wishes to do his best for his patient's welfare, regardless of the patient's demand for the immediate use of one of the "wonder drugs," would do well to constantly ask himself the question, "Is this the time to give or not to give a sulfonamide or an antibiotic?"

COMMITTEE ON MILITARY SERVICE

The Committee on Military Service as established by our House of Delegates (see account of special meeting of House of Delegates in this issue of the Journal) is now functioning efficiently under the chairmanship of Dr. Frank Owens. When one considers the conditions which prevailed in 1941 and 1942 with regard to the induction of physicians into military service and compares them with present conditions, one cannot but realize the progress which has been made in settling this knotty problem.

We wish to congratulate Dr. Owens and every member of the Committee on the work which they are doing. The task which they have is neither small or easy, as those who worked with Dr. W. L. Pressly on Procurement and Assignment problems in World War II, can testify. But it is a job that has to be done if the public is to be protected and if the individual members of the profession are to receive just treatment.

POSTGRADUATE COURSES IN MEDICINE

There is no longer any excuse for a practicing physician to "get into a rut" in the practice of medicine. Post-graduate courses in medicine are being presented at places and times which are easily adaptable to a physician's wishes and needs.

This Journal has tried to keep our members informed as to courses which are available and we would like to call attention to the Postgraduate Course in Cardiology which is being presented by the Emory University School of Medicine in Atlanta, March 5 to 9. Speakers and discussants will consist of the members of the faculty of medicine, and Drs. Paul White of Harvard University School of Medicine and Eugene Stead of Duke University School of Medicine.

Those who are interested should write to the Director of Postgraduate Education, Emory University School of Medicine, 36 Butler St., S. E., Atlanta 3, Georgia.

MEETING OF THE HOUSE OF DELEGATES

Columbia, S. C.
Sept. 10, 1950

At the request of the Council, a special meeting of the House of Delegates was held in Columbia on

Sept. 10., to consider the creation of a Committee on Military Service.

After the meeting was called to order by the President, Dr. W. R. Tuten, the purpose of the meeting was stated by the Secretary, Dr. N. B. Heyward, and the following recommendations were presented for consideration: (The original resolution had been presented by Dr. J. P. Price to the Council and had been approved by that body.)

The Council recommends to the House of Delegates the creation of a standing committee on military service which shall be composed of a chairman, one member of the Association from each judicial district, with the President, Secretary, and Business Manager of the Association serving as ex officio members.

The members of the committee shall be elected as follows: The council shall nominate three members to serve as chairman of the committee and the election shall be made by the House of Delegates. It shall be understood that further nominations may be made from the floor at the time of the election.

The delegates from the counties in each judicial district shall nominate one or more of their members to serve as the representative from that district on the committee, and the election shall be made by the House of Delegates.

It shall be the duty of this committee to:

1. Compile data relative to every physician in the state—age, type of practice, former military service, etc.
2. To determine the availability of physicians in South Carolina for military service in terms of the needs of the armed forces and of the local populace.
3. Adapt itself to conform with such rules and regulations as may be required so that it can serve as an advisory committee to any Federal Agency which may be established in South Carolina concerning the Procurement and Assignment of physicians.

"The chairman and two members of the committee, elected by the committee, shall serve as an executive Committee."

The Chairman of the committee shall serve as the spokesman for the State Association in matters relative to the Procurement and Assignment of physicians in this state for military service and shall be the nominee of the State Association for state chairman of such agency as the Federal Government might create.

Discussion of the recommendations was extensive and lively. Those who participated were Drs. Joe Cain, O. B. Mayer, Kenneth Lynch, Hugh Smith, N. B. Heyward, J. D. Guess, L. P. Thackston, J. H. Gressette, C. B. Epps, J. P. Price, William Weston, Sr., Furman Wallace, Sam Cantey, J. H. Young, Adam Hayne, W. T. Brockman, O. B. Chamberlain, and Ned Camp.

Some argued that the proposed committee was too large and cumbersome, others contended that the executive committee was not given enough authority. The question arose as to the exact status of the chairman of the committee and how much authority he would have to act without the approval of the entire committee.

The resolution, as presented, was finally adopted with the following amendment:

"The chairman and two members of the committee, elected by the committee, shall serve as an executive committee to act in an official capacity."

The house then entered into the election of the members of the committee, with the following results:

Chairman—Dr. Frank Owens, Columbia
First District—Dr. Lawrence Thackston, Orangeburg
Second District—Dr. Wallis Cone, Williston
Third District—Dr. N. O. Eaddy, Sumter
Fourth District—Dr. Paul Barnes, Bennettsville
Fifth District—Dr. Carl West, Camden
Sixth District—Dr. Roderick Macdonald, Rock Hill
Seventh District—Dr. Leon H. Poole, Spartanburg
Eighth District—Dr. C. J. Scurry, Greenwood
Ninth District—Dr. O. B. Chamberlain, Charleston
Tenth District—Dr. Thos. Gaines, Anderson
Eleventh District—Dr. W. W. King, Batesburg
Twelfth District—Dr. I'On Weston, Mullins
Thirteenth District—Dr. W. W. Edwards, Greenville
Fourteenth District—Dr. G. C. Brown, Walterboro

A committee, appointed by the President, brought in the following resolution, which was adopted unanimously:

"The House of Delegates of the S. C. Medical Association assembled for the purpose of recognizing the national emergency of the present wherein the medical profession is called upon to furnish medical officers in an expanding military organization and for the purpose of providing the cooperation required to make the best possible distribution of the available medical personnel, recalls with deep gratitude the personal devotion of Dr. W. L. Pressly in guiding the profession of the state in the similar emergency of World War II and to this date, and wish to express its thanks to Dr. Pressly for that self-sacrificing service, and the hope of this House of Delegates that in the present national and state emergency, the Association and its agencies may feel free to call upon Dr. Pressly for guidance out of his experience and wisdom."

W. T. Brockman,
Kenneth Lynch,
Lawrence Thackston,
Committee.

It was brought to the attention of the House of Delegates that the term of Dr. L. Emmet Madden of Columbia on the Hospital Advisory Council to the State Board of Health had expired. Upon motion, duly seconded, a resolution was adopted nominating

Dr. Madden to succeed himself on the Hospital Advisory Council, and the Secretary was instructed to send the nomination to the Governor.

Adjournment.

Minutes of Council Meeting
September 7, 1950, 4:00 P. M.

The Meeting was called to order at 4:10 p. m. by Dr. O. B. Mayer, Chairman, at the Columbia Hotel, Columbia, S. C. All members present. The minutes of the previous meeting were read and adopted as read.

The floor was then turned over to Dr. W. L. Pressly, as the meeting was called for his benefit. Dr. Thackston, seconded by Dr. Sease, nominated Dr. Pressly for temporary chairman of the Advisory Committee for Procurement and Assignment of physicians in South Carolina. After much discussion by all, this motion was tabled in order to make another motion.

Dr. Hugh Smith, seconded by Dr. J. H. Stokes, then moved that a temporary committee, composed of Dr. Mayer, chairman, Dr. N. B. Heyward, and Dr. W. T. Barron, be appointed to serve until the House of Delegates could be convened to take action. This was passed.

Dr. Julian Price then read a plan for a Committee of Military Affairs to be submitted to a called meeting of the House of Delegates of the South Carolina Medical Association, to take action.

Dr. Price then moved, seconded by Dr. Chapman, that the Secretary be instructed to call a meeting of the House of Delegates at he Columbia Hotel on Sunday, September 16th, at 3:00 p. m. This was passed. Dr. Price then offered an amendment to his plan so that the Chairman and two members, elected from the Committee at large, could be named the Executive Committee.

Dr. Pressly was then nominated for the permanent chairmanship, by Council, of this Committee, with Dr. Chamberlain and Dr. W. T. Barron serving as the other two members. This Committee was to be presented to the House of Delgates, for appointment.

Council adjourned at 6:00 p. m.

Respectfully submitted,
N. B. Heyward, M. D.
Secretary

Minutes of Council Meeting
Monday, January 8, 1951

The Called Meeting of Council was held at the Columbia Hotel, January 8, 1951. The Meeting was called to order at 4:00 p. m. by Dr. O. B. Mayer, Chairman. Others present were: Drs. Sease, Tuten, McCants, Price, D. L. Smith, Chapman, Alford, Joe Cain, Jr., Guess, Stokes, Heyward, and Mr. Meadors.

Dr. Price suggested that the minutes of the called meeting of the House of Delegates be printed in The Journal. It was suggested that the Secretary furnish an abbreviated copy for publication. The Secretary brought out the fact that the copies of the minutes of Council meeting extending over the past several months, had been sent to the Journal but had not yet been published.

Dr. J. K. Webb, Chairman of the State Committee on the Care of the Indigent, then reported in detail, the plans of this Committee. After considerable discussion by Drs. Price and Ben Wyman, and by Mr. Rivers, State Director of the State Department of Public Welfare, it was moved by Dr. Chapman, seconded by Dr. McCants, that the plan be approved by Council and recommended for adoption to the House of Delegates at a Called meeting in the near future, at the discretion of Dr. Tuten, the President. It was left to Drs. Tuten, Webb, Heyward, and Mr. Meadors, to decide on a date for the meeting since a copy of the plan must be provided for each delegate and sent when notices of the meeting go out.

It was moved by Dr. Guess, seconded by Dr. Tuten, that a fee of five dollars ($5.00) be allowed for filling out the application of the Indigent who wish to come under the benefits of the plan.

Dr. Ben Wyman then discussed and presented the Civilian Defense Plan and furnished copies of this plan for the information of Council. Since the Advisory Council for the Defense Plan would embrace Doctors, Dentists, Veterinarians, and others, it was suggested that each Councilor nominate one man from his medical district to serve on this Advisory Council.

It was moved by Dr. Guess, seconded by Dr. Tuten, that members of the Association in Service at the time the dues are payable, shall be excused from these dues if their local society dues are excused. This shall extend through the time of their terminal leave.

Dr. Stokes, Treasurer, reported that seventy-five members of the State Association have not paid their State dues for 1950 and approximately 275 members have not paid their A. M. A. dues.

It was recommended that the S. C. Medical Association contribute to the fund set-up by the A. M. A. for the purpose of helping needy medical schools. It was also decided to offer for sale to libraries over the State, copies of the history of the S. C. Medical Association, at a price of $3.50 per copy, the money to be paid into the Association Treasury. This motion was made by Dr. Sease, seconded by Dr. Price.

Adjournment at 6:10 p. m.

Respectfully submitted,

N. B. Heyward, M. D.

Secretary

THE TEN POINT PROGRAM

M. L. MEADORS, DIRECTOR OF PUBLIC RELATIONS AND COUNSEL

"IN TERMS OF SURVIVAL"

Mr. Stuart Symington, Chairman of the National Security Resources Board, and therefore one of the very top men in current national mobilization for defense, made, in the minds of many of his hearers, the most impressive statements of any heard at the recent Washington Conference of state and national advisory committees to Selective Service.

Mr. Symington appeared before the Conference for only about five minutes, but some of his words will not be forgotten. He wondered if his audience realized the gravity of the situation. Then he said, "I can assure you that it is the most grave situation that the country has ever faced." We have been accustomed, said Mr. Symington, "to think and talk of victory. Now we are thinking in terms of survival."

(Because of its continuing importance, we are carrying in full below the letter with respect to doctor-draft regulations which was mailed to the entire membership of the Association, under date of January 23, 1951.)

WASHINGTON MEETINGS ON DOCTOR-DRAFT

RUSK COMMITTEES DISCUSS PROBLEMS, REACH SOME DECISIONS. In three days of meetings (Jan. 11, 12 and 13) representatives of State Advisory Committees to Selective Service and Dr. Howard Rusk's National Committee discussed doctor-draft and other health service problems and made some policy decisions.

Attending the meetings from South Carolina were: Dr. Frank C. Owens, Chairman; Dr. Ben F. Wyman, State Health Officer; and Dr. Neil MacCauley, representing the Dental Profession; members of the State Advisory Committee appointed by Dr. Rusk; also Dr. Lawrence P. Thackston, Vice-Chairman of the Committee, Dr. Clarence Guyton and M. L. Meadors.

Following are a few of the more important developments at the meetings:

1. It was emphasized that under present plans, all available physicians in Priority I will be called for service (excepting of course those deferred for various reasons) before going into Priority II. In the same manner, Priority II will be exhausted before drawing on Priority III. At present there is no prospect that men in Priority IV will be called to service at any time within the foreseeable future.

2. Federal funds will be available to committees, through Selective Service, for travel, telephones and clerical help. State Selective Service offices may already have received the budgets.

3. The National Committee will advise state and local committees to contact all 1-A Priority I physicians who have not asked for commissions, urging them to apply for reserve commissions. The National Committee points out that under the doctor-draft law all these men must be called to service before calls are made on Priority II. If these men don't volunteer, and since their services are "obviously needed," the National Committee will "recommend to Selective Service that procedures for selection of special registrants for induction as prescribed in Public Law 779 (doctor-draft) be carried out."

4. Local Committees are advised not to ask Selective Service deferments for Priority I interns applying for residencies, even in the critical specialties. In such cases, the men are to be advised to apply for reserve commissions. Because of special aptitudes, local committees then might want to ask the military to delay orders in a few cases. (The military services are prepared to set up their own specialty training program if this is found necessary.)

5. For purposes of action on hospitals' requests for deferments, the National Committee advises that all time spent after 12 months is to be considered as a residency.

As was pointed out in our recent letter, the State Advisory Committees henceforth beginning with the calls for April 1st, will pass upon the availability of officers called from the reserve units in the same manner as they have done heretofore with respect to those under the doctor-draft Act. The committees' responsibilities in that respect are confined to recommendation as to whether or not it is essential to the welfare of a community that a physician remain at home.

If any physician under the age of 50 who is not a member of any of the reserve components of the Armed Forces, failed to register in either the October 16th or January 15th registrations, he is advised and urged to contact his local Selective Service board immediately. If in doubt as to his status, he should get in touch with Dr. Frank C. Owens, Chairman, or some member of the State Advisory Committee appointed from the South Carolina Medical Association.

In summarizing results of the Washington meeting of state representatives—the chairman and two other members from virtually every state—Dr. Rusk emphasized that the profession should "be proud of where we are today—far ahead of most other fields in planning for the emergency." He noted the many remaining problems, but said machinery was set up for

solving them. Dr. Rusk reminded the state representatives that their responsibilities extended far beyond their roles as advisors on doctor-draft and military reserve problems. He said that shortly nurse procurement committees may have to be incorporated into the basic state committees, and that the state committees will be expected to take major responsibilities in civil defense preparations.

SOUTH CAROLINA DOCTORS REGISTER

According to figures released by the South Carolina office of the Selective Service system, a total of 823 doctors, dentists and veterinarians registered in South Carolina under the provisions of Public Law 779, the so-called "Doctor-Draft Act." Of these, 164 in Priorities I and II, (men who had received medical training at government expense and had served less than 21 months) registered on October 16th.

In the second registration on January 15th, 659 others added their names. All the registrants were under 50 years of age.

Up to January 21st, a total of 85 had been called up for pre-induction examination—all of them from Priorities I and II.

Information at the same time was that of all the doctors so far called, only three had indicated their desire to accept a commission.

INFORMATION ON MEMBERSHIP DUES

The following information on membership dues for the American Medical Association for 1951 has been compiled by the office of the Secretary of the American Medical Association. This has been made available through the Secretary's Letter by Dr. George F. Lull for officers of the American Medical Association and all county and state medical organizations. It was printed in the Journal of the A.M.A., January 6, 1951, and is reproduced here for the interest and information of the members of the South Carolina Medical Association.

1. American Medical Association membership dues for 1951 are $25.

2. Fellowship dues for 1951 are $5 and are exclusive of membership dues.

3. American Medical Association membership dues are levied on "active" members of the Association. A member of a constituent association who holds the degree of Doctor of Medicine or Bachelor of Medicine and is entitled to exercise the rights of active membership in his constituent association, including the right to vote and hold office as determined by his constituent association, and has paid his American Medical Association dues, subject to the provisions of the By-Laws, is an "active" member of the Association.

4. American Medical Association membership dues are payable through the component county medical society or the constituent state or territorial medical association, depending on the method adopted locally.

5. Fellowship dues are payable directly to the headquarters of the American Medical Association, 535 North Dearborn Street, Chicago 10, on receipt of the bill for such dues.

6. A dues paying, active member is eligible for Fellowship and may request such status by direct application to the Secretary of the American Medical Association. Applications for Fellowship are subject to approval by the Judicial Council of the Association.

7. Commissioned medical officers of the United States Army, the United States Navy, the United States Air Force or the United States Public Health Service, who have been nominated by the Surgeons General of the respective services, and the permanent medical officers of the Veterans Administration, who have been nominated by its Chief Medical Director, may become Service Fellows on approval of the Judical Council. Service Fellows need not be members of the component county or constituent state or territorial associations or the American Medical Association and do not pay Fellowship dues. They do not receive any publication of the American Medical Association except by personal subscription. If a local medical society regulation permits, a Service Fellow may elect to become an active member of a component and constituent association and the American Medical Association, in which case he would pay the same membership dues as any other active member and receive a subscription to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

8. An active member of the American Medical Association may be excused from the payment of American Medical Association membership dues when it is deemed advisable by the Board of Trustees, provided that he is excused from the payment of full dues by his component society and constituent association.

The following may be excused in accordance with this provision: (a) members for whom the payment of dues would constitute a financial hardship as determined by their local medical societies; (b) members in actual training for not more than five years after graduation from medical school, and (c) members who have retired from active practice.

9. Active members of the American Medical Association are not excused from the payment of American Medical Association membership by virtue of their classification by their local societies as "honorary" members or because they are excused from the payment of local and state dues. Active members may be excused from the payment of American Medical Association membership dues only under the provision described in paragraph 8 above.

10. American Medical Association membership dues include subscription to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. Active members of the Association who are excused from the

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Metamucil powder is taken with a full glass of cool liquid and may be followed by another glass of fluid if indicated. This assures the desired water volume conducive to physiologic peristalsis.

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SEARLE

RESEARCH IN THE SERVICE OF MEDICINE

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

payment of dues will not receive THE JOURNAL except by personal subscription at the regular subscription rate of $15 a year.

11. Member Fellows may substitute one of the specialty journals published by the Association for THE JOURNAL, to which they are entitled as members. A Fellow who substitutes a specialty journal will not receive THE JOURNAL.

12. A member of the American Medical Association who joins the Association on or after July 1 will pay membership dues for that year of $12.50 instead of the full $25 membership dues.

13. An active member is delinquent if his dues are not paid by December 31 of the year for which dues are prescribed and shall forfeit his active membership in the American Medical Association if he fails to pay the delinquent dues within thirty days after the notice of his delinquency has been mailed by the Secretary of the American Medical Association to his last known address.

14. Members of the American Medical Association who have been dropped from the Membership Roll for nonpayment of annual dues cannot be reinstated until such indebtedness has been discharged.

15. The apportionment of delegates from each constituent association shall be one delegate for each thousand (1,000), or fraction thereof, *dues paying active members of the American Medical Association* as recorded in the office of the Secretary of the American Medical Association on December 1 of each year.

CIVIL DEFENSE

The South Carolina Civil Defense Plan released within the past few weeks, places full responsibility regarding public health and medical care services on the State Board of Health. This phase of the defense activities will be headed by Dr. Ben F. Wyman, State Health Officer, and will call for cooperation on the part of physicians throughout the State.

The plan was presented to Council by Dr. Wyman on January 8th, and the method of its operation briefly outlined. Present plans call for an advisory council from the State Medical Association, and it is designed that members of the Council will render staff assistance to the extent that they will coordinate medical care services in their Districts.

It was decided that each member of the Council of the State Medical Association will appoint one physician to serve in his District, and Dr. Wyman's office will be notified of these appointments in the near future. The District representative in turn will be requested to appoint a physician to serve for each county in his District. The county members will be expected to serve as coordinators of medical care services in their respective counties.

It is the plan of the State Administrator for this phase of civilian defense to keep all of the physicians appointed in these capacities fully informed regarding civil defense activities at the State level in order that they may be of greatest service to the county medical societies in the development of county and municipal civil defense plans.

In view of the fact that both the state and the nation have been extremely slow in getting properly organized for civilian defense, it is especially important that the plan formulated and now being set up be given the fullest cooperation by all members of the public when called upon. The medical profession will occupy one of the most essential positions if the time ever comes when it is necessary for the plan to be put into effect. It will be too late then to set up an organization and familiarize ourselves with specific duties. The time to prepare for such an eventuality is now. All physicians who may be called upon to assist in any phase of the civil defense plan are urged to cooperate fully with the State Health Department and the Civil Defense Director's office.

A. M. A. EDUCATNON FOUNDATION FORMED

Articles of incorporation for the formation of "The American Medical Education Foundation" have been issued by the Secretary of State's office in Springfield, Illinois. The papers were dated December 20, 1950.

The purposes for which the corporation was organized are:

"To promote the art and science of medicine and the betterment of public health by providing or aiding in the providing of financial aid to recognized schools or institutions of medical education responsible for the education and training of the medical manpower of the United States;

"To distribute funds, monies or contributions to medical schools and institutions;

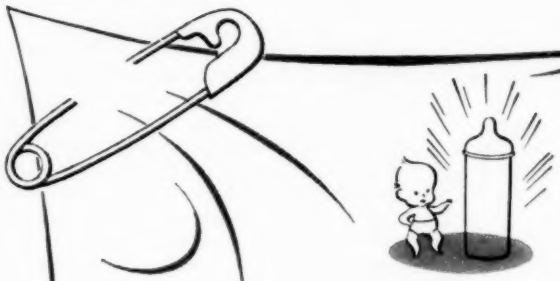
"To determine the amount, manner and conditions in which and under which available funds will be distributed or granted to eligible schools or institutions."

The board of directors of the new not-for-profit corporation will consist of 11—several members of the A.M.A. Board of Trustees, and several members og the A.M.A. Council on Medical Education and Hospitals.

When the funds are distributed to the medical schools there will be no strings attached. This was made clear last December when the A.M.A. Board of Trustees first took action in initiating such a fund.

Incidentally, the A.M.A. has made application to the U. S. Department of Internal Revenue, requesting that donations to the fund be made tax exempt.

The foregoing information was released in a letter from the Secretary of the A.M.A. early in January. A subsequent report calls attention to the contributions already coming in for addition to he fund and the apparent assurance of its growth.



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Lactogen is simple to use. The prescribed amount is stirred into warm, previously boiled water. Either a single feeding can be prepared, or the entire day's quantity can be made up and stored in the refrigerator until used.

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The Board of Trustees, in establishing the fund, expressed the hope that the Association's contribution would be greatly augmented by gifts from many other sources and urged all members of the A.M.A. to contribute.

It is planned that the Foundation will coordinate its activities closely with other major efforts to raise funds for medical education by voluntary means. Further announcement along this line is expected shortly.

FAVORABLE PRESS REACTION

The A.M.A. Board of Trustees' action in setting up the half-million dollar fund for aid to medical education, got favorable reaction from leading newspapers over the country.

The Cleveland Plain Dealer (Dec. 8th), in the city where the announcement was made, expressed its views thus:

"The American Medical Association would not possibly spend money from its national education campaign fund any better than by allocating it, without strings attached, to accredited medical schools, which are hard-pressed financially.

"Announcement that the A.M.A's governing body, the House of Delegates, had voted $500,000 in subsidies to 79 schools of medicine was made at the clinical session of the association, here in Cleveland.

"This is aid to medical education from the right source, from the medical profession itself, instead of from the federal government; for the inevitable concomitant of federal subsidy is a steadily increasing measure of federal control.

"The action by the A.M.A's House of Delegates is heartening. It should be copies by all who are concerned with the preservation of medical education, inquiry and research unfettered by government regulation.

"Medical education in this country badly needs unrestricted operating funds and endowments, so that the administrators of medical schools may use those funds in the way in which they believe mankind will be most benefited and the nation best assured of fully qualified medical and surgical practitioners.

"We like to regard such action by the A.M.A. as the beginning of the doctors' own subsidy to medical education, as evidence of new progressivism and enlightenment in the association leadership. The A.M.A. is fully justified in raising funds to combat socialization of medicine, but it should not use those funds wholly in a propragandistic and negative way. Its $500,000 grant to the medical schools, which was described as 'the nucleus of a fund which we hope will be greatly augmented by contributions from many other sources,' is a wise and proper expenditure."

The St. Louis Post-Dispatch (Dec. 7th) said:

"Whether it will be possible in fact to meet the requirements from private funds remains to be seen. But the A.M.A. has given a challenge to those Amerimans who agree with it that such help must come from private, instead of public sources. Individuals, corporations and philanthropic funds now have a chance to convince the daubters. And meanwhile the A.M.A., under fire recently because it spent $1,000,000 in the last political campaign, has earned congratulations for taking its most progressive step in years."

And the Los Angeles Times (Dec. 9th):

"The move of the American Medical Association to set up a fund for the support of private medical schools, to head off further Federal subsidies which the doctors deplore, is interesting and laudable. Government has moved into many new fields for the reason, or at least on the pretext, that private sources were insufficient.

"Whether the doctors can raise the kind of money required to maintain modern medical schools is another question.

"If doctors and other citizens who recognize the dangers inherent in increasing Federal financing of education would support private educational institutions with adequate gifts and bequests, the trend might still be arrested. But here are not enough millionaires left to do it; the money must come from middle-income men who are willing to pay for what they profess."

NEWS ITEMS

Dr. Preston Edwards, formerly health officer in Horry County, has opened offices in Darlington for the practice of ophthalmology.

Dr. W. Lawrence Salter, formerly of Hampton, has moved to Spartanburg and is associated with the Mary E. Black Memorial Hospital.

Dr. A. P. Duff has opened offices in Greenville for the general practice of medicine.

Dr. J. I. Waring, Charleston pediatrician, has been appointed associate director of the Division of Maternal and Child Welfare and Crippled Children of the State Board of Health. He gave up his private practice January 1 to assume his new duties.

At the second annual meeting of the South Carolina Academy of General Practitioners, Dr. T. G. Goldsmith of Greenville, was elected president.

Dr. C. R. F. (Dick) Baker and Dr. L. B. (Bo) Keels have formed a partnership in Sumter for the practice of surgery. Both are Diplomates of the American Board of Surgery.

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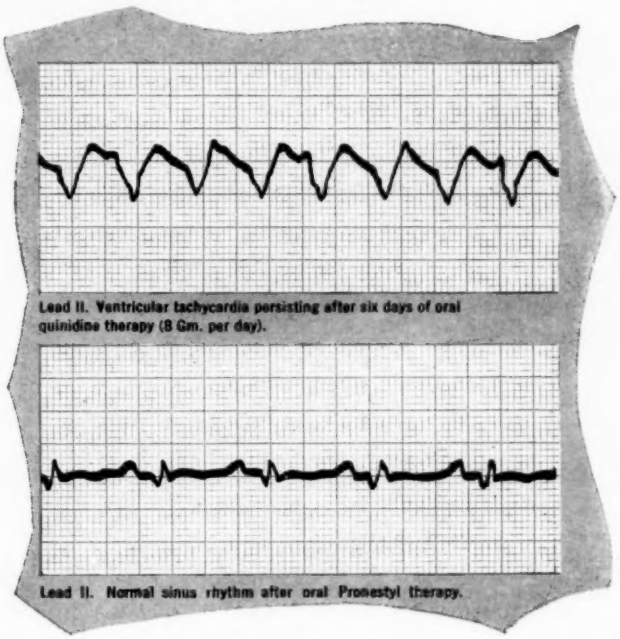

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SQUIBB MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858.

Dr. John B. Truslow, formerly Assistant Dean of Columbia College of Physicians and Surgeons became Dean of the school of medicine January 1. Dean Truslow succeeds Dr. Harvey B. Haag, who resigned in order to give full time to teaching and research in the department of pharmacology of which he has been head for many years.

Dr. Harry Lyons, Professor of Periodontia and Oral Pathology, was made Dean of the school of dentistry January 1, succeeding the late Dr. Harry Bear. Doctor Lyons retired from private practice in Richmond in order to accept the deanship on a full-time basis.

At its Commencement in June the college will confer upon State Senator Lloyd C. Bird, a graduate of its school of pharmacy, the honorary degree of Doctor of Laws. Miss Nora Spencer Hamner, a graduate of its school of nursing, will receive the honorary degree of Master of Science in Nursing. Both have made wide contributions to education and to science in the community and the Commonwealth.

The Forty-Fifth General Hospital, sponsored by the college in World Wars I and II, has been reorganized and becomes an Organized Reserve Training Unit in the Virginia Military District. Colonel John Powell Williams, Professor of Clinical Medicine, and Chief of the Medical Service at McGuire Veterans Hospital will be in command.

Miss Louree Pottinger has been appointed Director of Nursing Service and Associate Professor of Nursing, replacing Miss Margaret Denniston who resigned January 8.

Dr. Frederick M. Salisbury joined the faculty on February 1 as Assistant Professor of Denture Prosthesis.

A splendid attendance was noted at the symposium on alcoholism held January 16 and 17. The alcoholic clinic at the college is under a joint program with the Virigina Board of Health.

A portrait of the late Dean Harry Bear of the school of dentistry was presented to the college with appropriate ceremonies on January 27. The portrait is the work of David Silvette of Richmond, and is the gift of friends of the late Dean.

February 2, 1951

WOMAN'S AUXILIARY
SOUTH CAROLINA MEDICAL ASSOCIATION

President: Mrs. A. F. Burnside, Columbia, S. C. **Publicity Secretary: Mrs. Weston Cook, Columbia, S. C.**

The Charleston Branch of the Woman's Auxiliary to the South Carolina Medical Association has gotten off to a good start on what promises to be a busy year.

The first board meeting was held on Thursday, October 12th, at which time plans and program for the year were discussed, and decided upon. Our theme is to be a continuation of the Nurse Recruitment Program.

Miss Ruth Chamberlin, President of District Nurses, was guest speaker at the first regular meeting Tuesday, October 24th, in Annex-A of the Nurses' Home. She asked that the Auxiliary again offer the scholarship to a worthy student-nurse and suggested that if further funds were available, they could be used to good advantage by other students who need financial aid. Miss Chamberlin also told of the need for the redecoration of a reception room for nurses in the old Riverside Hospital. After discussion a committee was appointed, with Mrs. Bachman S. Smith, Jr., chairman, to proceed with the business of redecoration. Immediately there could be heard the merry hum of portable sewing machines and happy voices, as the committee went forward, measuring, pinning, basting and stitching the brightly colored materials for slip covers and curtains. With the aid of a handyman a window-box was built and supplied with plants from the ladies' gardens. Lamps, pictures, waste paper baskets, ash trays and other items were purchased. Two weeks later the work was finished, and the bare cold-looking room, which was once an operating room, had been transformed into a beautiful and inviting recreation-living room where the girls may leisurely relax, or proudly entertain.

On Tuesday, November 21st, the Auxiliary held a luncheon meeting at Henry's restaurant. We were particularly privileged at this meeting to have as the guest-speaker, Mrs. Alfred F. Burnside, President of the State Auxiliary. Mrs. Burnside outlined practical methods for combatting Socialized Medicine, and said that the Auxiliary should assist the Doctors in the fight for three reasons: For the nation's health, for economics, and for the Medical Profession.

A benefit bridge party to raise money for the Nurses' Scholarship fund, has been set for January, and plans for a party honoring our husbands on Doctor's Day in March, are going forward.

Mrs. Clay W. Evatt, President

The Pickens County Medical Auxiliary held their December meeting at the home of Mrs. J. H. Cutchin with Mrs. T. P. Valley and Mrs. J. W. Potts as cohostess.

Mrs. Roy Gaston, President, called the meeting to order, and welcomed as guest, the State President, Mrs. A. F. Burnside and Mrs. Emmet Madden, both of Columbia.

Mrs. P. J. Moore led the devotional, concluding with prayer.

A business session was conducted and a vote was made to send cards to our doctors in service. Christmas rememberances were sent to the hospital at Six Mile.

T. B. pictures are to be shown in High Schools during January.

Mrs. Burnside was guest speaker and told interstingly of auxiliary work.

The Christmas tree for members was enjoyed and gifts were presented to the guest.

Aftr the meeting, the hostesses served a buffet luncheon.

Mrs. W. B. Furman
Publicity Chairman

BULLETIN

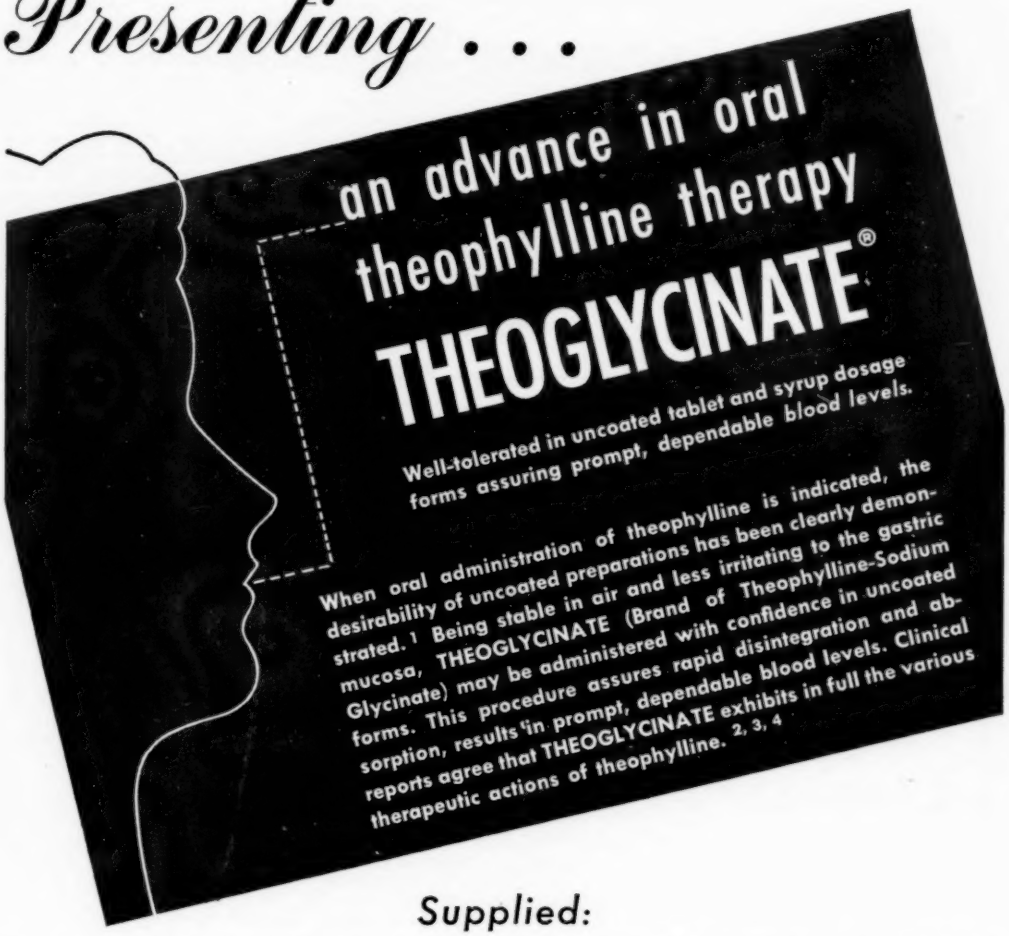
Your Bulletin Chairman has received subscriptions from the local Bulletin Chairman, getting reports from most of them. The response has been good but not good enough. All members of the Auxiliary are urged to subscribe. Just one dollar per year will make you an informed member of the Auxiliary. We need this information. Please contact your local Bulletin Chairman and tell her you want to subscribe.

To the Chairmen let me say, "Contact your members. They will probably subscribe if asked to do so."

(Mrs. E. O.) Mary P. Hentz
State Bulletin Chairman.

A card party and luncheon were enjoyed by members of the Woman's Auxiliary to the Columbia Medi-

Presenting . . .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1. Waxler and Schack, J.A.M.A., 143:736 (1950).
2. Bubert and Cook, Bull. Univ. Maryland Medical School, 32:175 (1948).
3. Paul and Montgomery, Jnl. Iowa State Medical Society, 38:237 (1948).
4. Krantz, Holbert, Iwamoto and Carr, J.A.Ph.A., 36:148 (1947).

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ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

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cal Society Tuesday, January 9, at the Forest Lake country club.

Bridge and canasta were played during the social hour and Mrs. J. E. Boone won the door prize, a lovely potted plant.

Tables for luncheon were attractively decorated with arrangements of magnolia leaves. Mrs. John Holler is chairman of the decorating committee.

A number of books were collected by members for the nurses' library at the Columbia Hospital.

A short business session was held after lunch. Mrs. R. Wilson Ball, president of the auxiliary announced that the next meeting of the auxiliary would be held Tuesday, March 13, at which time officers will be elected for 1951-52. Mrs. Izard Josey was appointed chairman of the nominating committee and serving with her will be Mrs. William Weston, Jr., and Mrs. Gerald Scurry.

A request was made for volunteers for the March of Dimes campaign, by Mrs. Gordon Seastrunk. Anyone wishing to volunteer for this work was asked to call Mrs. Hugh Wyman, public relations chairman.

After the business session an interesting movie of the recent American Medical Association convention at San Francisco was shown by E. S. Powell of the State Board of Health staff.

DEATHS

CHARLES B. SKINNER

Dr. Charles B. Skinner, 30 years old, died enroute to a Hartsville hospital on the afternoon of January 3. He had been partly confined to his home for several weeks with a virus infection before his untimely death.

A native of Lee County, Dr. Skinner received his education at Bishopville High School, Duke University and the Medical College of the State of South Carolina (Class of 1944). He interned at the University of Maryland Hospital in Baltimore before serving in the Navy during World War II. He had practiced in Hartsville since his discharge from the Navy.

Dr. Skinner is survived by his parents, Mr. and Mrs. J. C. Skinner of Lee County and two sisters.

EUGENE HOBART KING

Dr. E. Hobart King, 54, was instantly killed January 7 when his car collided head on with another vehicle near Hartsville.

Dr. King was born in Darlington County and received his education at Wofford College and the Medical College of South Carolina (1924). For the past twenty-five years he had practiced in Hartsville. He was a veteran of World War II.

Survivors include his widow, the former Miss Grace Lee, his mother, four brothers and one sister.

PERRY MARTIN WORKMAN

Dr. Perry M. Workman, 43, died on December 26 as a result of burns received when his bed where he was sleeping caught fire at his home in Lyman.

A native of Woodruff, Dr. Workman was graduated from the Medical College of South Carolina in 1932. He was practicing in Lyman at the time of his unfortunate death.

Dr. Workman is survived by his mother, one sister and two brothers.

JOHN W. DOUGLASS, SR.

Dr. John W. Douglass, Sr., retired physician of Winnsboro, died January 3 in a Greenville Hospital following several months of ill health. He had been critically ill for a week.

Dr. Douglass, 78, was the son of the late Dr. and Mrs. Thomas G. Douglass. He attended Columbia University and was graduated from the Medical College of South Carolina. For a good many years Dr. Douglass was narcotics inspector for the state of South Carolina. Later he moved to Winnsboro where he practiced until his retirement in 1941.

Dr. Douglass is survived by his widow, a son, Dr. John W. Douglass, Jr. of Greenville, and a daughter.

South Carolina Medical Association

1950-1951

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Ninth District
(Spartanburg, Union, Cherokee)
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Dr. O. B. Chamberlain, Medical College, Charleston, S. C.

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14th Judicial District
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